



Tier Environmental Ltd

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TE1291-TE-00-XX-CO-GE-001-V01

FAO Peter Lamoury

Caddick Construction
Chepstow House,
Trident Business Park,
Warrington,
WA3 6BX

10 September 2021

**PROPOSED MUGA PITCH / EXISTING CAR PARK AREA, THE MANCHESTER COLLEGE SOIL
WASTE CLASSIFICATION AND ASBESTOS ASSESSMENT LETTER**

Dear Peter,

Tier Environmental were appointed to conduct a supplementary ground investigation within the area of a pre-existing car park and the proposed future MUGA pitch located at the Openshaw Campus, The Manchester College located off Ashton Old Rd, Openshaw, Manchester M11 2WH.

The objectives of this letter are to summarise the works conducted and provide a soil waste classification and waste disposal route determination for shallow soils (<1m bgl) and to summarise the presence / absence of asbestos that has been previously identified in this area.

Fieldwork

Tier Environmental conducted 10 No. hand excavated pits (labelled TPA to TPJ) to depths between 0.55m bgl (TPB) and 1.00m bgl (TPC, TPE, TPF, TPG, TPH and TPJ) at locations shown on Drawing No. TE1291-TE-00-XX-DR-GE-001-V01.

Geoenvironmental chemical testing was carried out on selected samples. Sampling and QA/QC protocols are presented in Appendix C. Tier Environmental's schedule of chemical laboratory testing is presented in Table 1, below. The testing was carried out by Element Materials Technology, a UKAS and MCerts (where appropriate for soils analysis) accredited laboratory.

Table 1 – Schedule of Chemical Testing for Waste Soils Assessment.

Laboratory analysis	Made Ground - Gravel	Made Ground - Clay	Asphalt
Tier Environmental soil suite*	8	2	
Asbestos screen	17	3	
Speciated TPH / BTEX / MTBE	8	2	

Laboratory analysis	Made Ground - Gravel	Made Ground - Clay	Asphalt
Coal tar suite	0	0	3
Waste Acceptance Criteria (WAC)	3	0	0

Ground Conditions

Tier Environmental engineer's logs are presented as Appendix B and are compliant with BS5930:2015+A1:2020 and BS EN 1997:2004 and 2007.

Overall Made Ground was encountered at all exploratory holes from ground level to depths between 0.55m (TPH) and >1.00m bgl (base not encountered – at TPA to TPE, TPG and TPI). The ground conditions encountered can be summarised as follows:

Asphalt

Asphalt was encountered at all exploratory hole locations encountered from ground level to depths between 0.07m bgl (TPG) and 0.10m bgl (TPA, TPB, TPD, TPE, TPF, TPH, TPI, TPJ).

Made Ground – Gravel Sub-base

Made Ground representative of a sub-base was encountered from 0.10m bgl (TPA, TPB, TPD, TPE, TPF and TPI) to depths between 0.15m bgl (TPF) and 0.50m bgl (TPI) and generally comprised:

- Light brown, slightly sandy or sandy, angular to subrounded, fine to coarse GRAVEL of limestone and sometimes sandstone

Made Ground – Gravel

Granular Made Ground (other than the sub-base materials described above) was encountered at all exploratory holes (with the exception of TPD and TPI) from depths between 0.07m bgl (TPG) and 0.20m bgl (TPA and TPE) to depths between 0.30m bgl (TPC) and 1.00m bgl (TPG). The base of this strata was not encountered at TPA and TPG. This stratum generally comprised:

- Dark brown / reddish brown or dark grey and black, slightly clayey, sandy to very sandy, occasionally slightly silty, angular to rounded, fine to coarse GRAVEL of brick, concrete, asphalt, mixed natural lithologies and clods of clay, with occasional fragments of potential ACM identified at TPA, low to high proportion of ash (TPB, TPC, TPG, TPH, TPJ), medium cobble content of angular to subangular brick at TPF and TPG, slate (TPG, TPJ), fragments of metal (TPG), clinker (TPH, TPJ), coal (TPJ)

Made Ground – Clay

Cohesive Made Ground was encountered at TPC, TPD, TPE and TPI from depths between 0.20m bgl (TPD) and 0.85m bgl (TPE) to depths between 0.70m bgl (TPD) and >1.00m bgl (TPC and TPE). The base of this strata was not encountered at TPC, TPE and TPI. This stratum generally comprised:

- Firm friable, dark brown, sandy, gravelly CLAY. Gravel is fine to coarse of brick, concrete, asphalt and mixed natural lithologies

Made Ground Obstructions

A brick obstruction was encountered between 0.70m and 0.80m bgl at TPD and a concrete obstruction was encountered between 0.50m and 0.55m bgl at TPB that prevented the advancement of these pits to the target depth of 1.00m bgl.

Glacial Till

Deposits representative of Devensian or Glacial Till were encountered at TPF, TPH and TPJ from depths between 0.55m bgl (TPH) and 0.90m bgl (TPF and TPJ) and generally comprised firm to stiff, dark brown, slightly gravelly CLAY. Gravel is subrounded, fine of mixed natural lithologies. The base of this stratum was not encountered during the investigation.

It was considered that the clay encountered at the base of the hand pit at TPJ may be reworked.

Visual / Olfactory Evidence of Contamination

Suspected Asbestos Containing Materials (ACMs) were encountered at TPA at which point the pit was terminated at 0.80m bgl for health and safety reasons.

Groundwater

No groundwater was encountered in any of the hand pits during the supplementary ground investigation.

Asbestos

Asbestos was reported in 10 No. of the 20 No. samples submitted for asbestos analysis. The results are summarised in the table below:

Table 1 – Asbestos Summary Table

Exploratory Hole Location	Depth (m bgl)	Location on Site Description	Soil Population	Asbestos Type	Quantification (% w/w)
Asbestos in Soil Samples					
TPB	0.50	North	Made Ground - gravel	Chrysotile - fibre bundles and fibrous borad	0.005
TPC	0.20	West	Made Ground – gravel	Amosite – free fibres	<0.001
TPG	0.25	Southwest	Made Ground - gravel	Chrysotile – free fibres	<0.001
TPH	0.40	South	Made Ground – gravel	Chrysotile – fibre bundles	<0.001
TPA	0.30	Northwest	Made Ground - gravel	Amosite - Asbestos Insulation Board (AIB) and fibre bundles	26.817
TPA	0.50	Northwest	Made Ground - gravel	Chrysotile and amosite – ACM debris and fibre bundles	0.006
TPE	0.75	Central / north	Made Ground - gravel	Amosite – fibre bundles	<0.001
TPI	0.60	Central / south	Made Ground – clay	Chrysotile – fibre bundles	0.002
TPJ	0.25	Southeast	Made Ground - gravel	Chrysotile – fibre bundles and ACM debris	0.072
TPJ	0.60	Southeast	Made Ground - gravel	Chrysotile – fibre bundles	<0.001

Asbestos has been previously identified (prior to this supplementary works) in some of the locations that are circled during the previous EEG Ground Investigation and there were also suspected asbestos cement sheets at TP6 and TP7. Tier Environmental have previously completed a remediation strategy which states a 600mm clean cover system is required in soft landscaped areas and Tier Environmental presume that the construction / build up of the MUGA pitch could be readily argued to comprise, in effect, 'hardstanding' such that it will offer sufficient protection from the underlying asbestos.

Figure 1 – Previously Identified Asbestos Areas (during previous EEG Investigations)



The recent Tier Environmental findings are consistent with the previous works with respect to identifying asbestos in this area of the Site.

On this basis, as asbestos has been reported at concentrations potentially above 0.001% w/w (i.e. above 'trace' levels), the Control of Asbestos Regulations 2012 should be adhered to. A summary of complying with CAR: risk assessments, licensing and training is provided in Appendix E.

The remediation requirements stipulated in Tier Environmental Remedial Options Appraisal, Remediation Strategy and Verification Plan (report reference: TE1291ROARS1.0, dated 12th March 2020) should be upheld.

Soil Waste Classification and Waste Disposal Route Determination

A summary of the soil waste classification and waste disposal route determination for the samples obtained is provided as Table 2, below.

Table 1 – Soil Waste Classification and Waste Disposal Route Determination Summary

Exploratory Hole Location	Sample Depths (m bgl)	Simplified Description of Sample	Basic Waste Characterisation Result	Driver for Hazardous Waste Classification	Contain Asbestos?	WAC Sample Available?	Likely Soil Waste Disposal Route Determination
Soil samples							
TPB	0.50m	Made ground – gravel	Non-hazardous	N/A	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)		
TPC	0.20m	Made ground – gravel	Non-hazardous	N/A	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)		
TPC	0.80m	Made ground - clay	Non-hazardous	N/A	No asbestos detected		
TPD	0.25m	Made ground - clay	Non-hazardous	N/A	No asbestos detected		
TPG	0.25m	Made ground – gravel	Hazardous	TPH, benzene, toluene, xylene	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)		
TPH	0.40m	Made ground – gravel	Hazardous	TPH	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)	Yes	Stable non-reactive hazardous waste cell in a non-hazardous landfill
TPA	0.30m	Made ground – gravel	Hazardous	Asbestos	Yes, exceeds the hazardous waste threshold (i.e. >0.1% w/w)		
TPA	0.50m	Made ground – gravel	Non-hazardous	N/A	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)	Yes	Non-hazardous landfill as PAHs and antimony, exceed inert waste landfill WAC criteria
TPF	0.70m	Made ground – gravel	Non-hazardous	N/A	No asbestos detected		
TPE	0.75m	Made ground – gravel	Non-hazardous	N/A	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)		
TPI	0.20m	Made ground – gravel sub-base	Non-hazardous	N/A	No asbestos detected	Yes	Inert landfill
TPI	0.60m	Made ground - clay	Non-hazardous	N/A	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)		
TPJ	0.25m	Made ground – gravel	Hazardous	TPH	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)		
TPJ	0.60m	Made ground – gravel	Non-hazardous	N/A	Yes, but below hazardous waste threshold (i.e. <0.1% w/w)		
Asphalt Samples							
TPD	0.05m	Asphalt	Non-hazardous	N/A	N/A		
TPJ	0.05m	Asphalt	Non-hazardous	N/A	N/A		
TPG	0.05m	Asphalt	Hazardous	Coal tar and PAHs	N/A		

N/A – Not applicable

Soil Waste Classification and Waste Disposal Route Determination – Discussion

Drawing No. TE1291-TE-00-XX-DR-GE-001-V01, appended, shows the locations of the hazardous waste identified.

A pattern of elevated hydrocarbons within the granular Made Ground in the southern part of the Site (TPG, TPH and TPJ) has been reported all of which are triggering these materials to be hazardous waste.

Asbestos Containing Materials (ACMs) at TPA in the northwest of the Site have been identified as triggering the requirement for these granular Made Ground materials to be disposed as hazardous waste.

Finally, of the 3 No. representative asphalt samples obtained, the asphalt population in the vicinity of TPG is coal tar containing and should therefore be disposed as hazardous waste. The asphalt populations sampled at TPD and TPJ; however, are suitable for disposal as non-hazardous waste.

The limestone/sandstone granular sub-base materials beneath the asphalt may be segregated and disposed to an inert waste landfill.

It is recommended that, apart from the hazardous waste and inert waste described above, that all remaining Made Ground soils should be disposed to a non-hazardous waste landfill.

For and on behalf of

TIER ENVIRONMENTAL LTD

A handwritten signature in dark ink, appearing to read "Adrian Read". The signature is fluid and cursive, with the first name being more prominent than the last.

Adrian Read MEng (Hons)

Technical Director

Tier Environmental Ltd

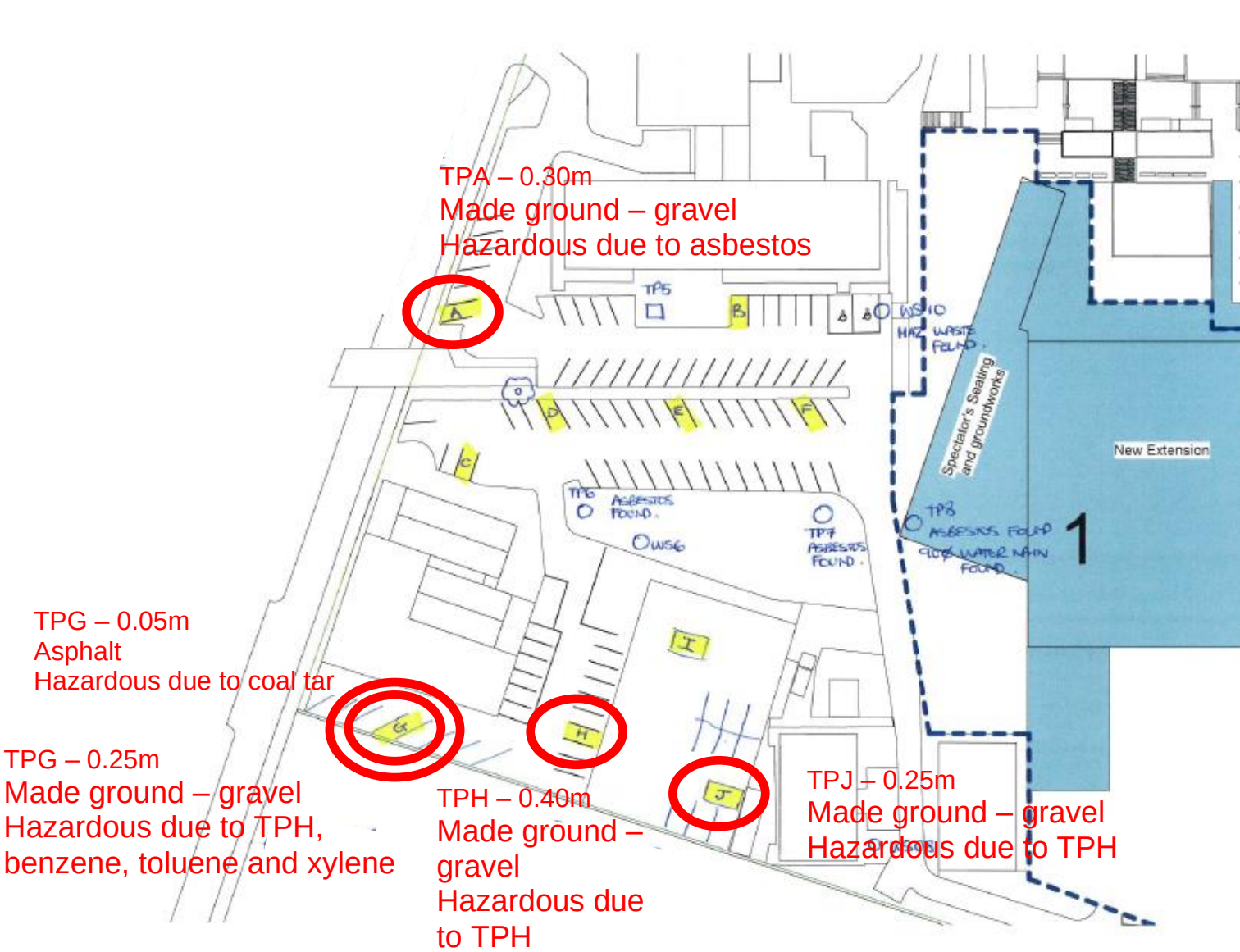


APPENDIX A - DRAWINGS



Exploratory Location Plan (extracted from Caddick Construction provided sketch) and Hazardous Waste Location Plan

Contract Number	TE1291
Contract	Manchester College
Client	Caddick Construction



Area where hazardous waste identified

Scale	NTS
Drawn by AR	Approved SL
Drawing Number	TE1291-TE-00-XX-DR-GE-001-V01



APPENDIX B – EXPLORATORY HOLE LOGS







Trial Pit Log

Trialpit No

TPD

Sheet 1 of 1

Project Name: The Manchester College

Project No.
TE1291Co-ords: -
Level:Date
05/08/2021

Location: Manchester

Dimensions
(m):Depth
0.80Scale
1:25Logged
AP

Client: Caddick Construction

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.05	ES		0.10			MADE GROUND: Asphalt.
	0.25	ES		0.20			MADE GROUND
							MADE GROUND: Light brown, sandy, coarse GRAVEL of limestone.
							MADE GROUND
	0.65	ES		0.70			MADE GROUND: Firm friable, dark brown, sandy, gravelly CLAY. Gravel is fine to coarse of brick, concrete, asphalt and mixed natural lithologies.
				0.80			MADE GROUND
							Brick obstruction.
							MADE GROUND
							End of pit at 0.80 m

1

2

3

4

5

Remarks: 1) No groundwater encountered 2) Terminated on obstruction.

Stability: Stable







Trial Pit Log

Trialpit No

TPF

Sheet 1 of 1

Project Name: The Manchester College

Project No.
TE1291Co-ords: -
Level:Date
10/08/2021

Location: Manchester

Dimensions
(m):Depth
1.00Scale
1:25Logged
AP

Client: Caddick Construction

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.10 0.15			MADE GROUND: Asphalt.	
							MADE GROUND	
	0.70	ES					MADE GROUND: Light brown, slightly sandy to sandy, medium GRAVEL of limestone.	
							MADE GROUND	
							MADE GROUND: Dark brown to reddish brown and grey, slightly sandy to very sandy, slightly clayey to clayey, angular to rounded, fine to coarse GRAVEL of brick, concrete, asphalt and mixed natural lithologies with a medium cobble content of angular to subangular brick.	
	0.95	ES		0.90 1.00			MADE GROUND	
							Firm, dark brown CLAY.	
							End of pit at 1.00 m	1
								2
								3
								4
								5

Remarks: 1) No groundwater encountered. 2) Terminated in natural ground.

Stability: Stable







Trial Pit Log

Trialpit No

TPH

Sheet 1 of 1

Project Name: The Manchester College

Project No.
TE1291Co-ords: -
Level:Date
05/08/2021

Location: Manchester

Dimensions
(m):Depth
1.00Scale
1:25Logged
AP

Client: Caddick Construction

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.10			0.10			MADE GROUND: Asphalt
	0.20	ES		0.25			MADE GROUND MADE GROUND: Dark grey and black, slightly sandy to very sandy, angular to rounded, fine to medium GRAVEL of asphalt, concrete and brick with moderate proportion of ash.
	0.40	ES		0.55			MADE GROUND MADE GROUND: Dark brown, slightly clayey, sandy, angular to rounded, fine to coarse GRAVEL of concrete, asphalt, brick, clods of clay, mixed natural lithologies and clinker.
				1.00			MADE GROUND Stiff, dark brown, slightly gravelly CLAY. Gravel is subrounded, fine of mixed natural lithologies.
							End of pit at 1.00 m

1

2

3

4

5

Remarks: 1) No groundwater encountered. 2) Terminated in natural ground.

Stability: Stable





Trial Pit Log

Trialpit No

TPI

Sheet 1 of 1

Project Name: The Manchester College

Project No.
TE1291Co-ords: -
Level:Date
10/08/2021

Location: Manchester

Dimensions
(m):Depth
0.85Scale
1:25Logged
AP

Client: Caddick Construction

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.20	ES		0.10			MADE GROUND: Asphalt. MADE GROUND
	0.60	ES		0.50			MADE GROUND: Light brown, sandy, angular to subrounded, fine to coarse GRAVEL of limestone and sandstone. MADE GROUND
				0.85			MADE GROUND: Firm, dark brown, slightly gravelly CLAY. Gravel is subangular to rounded, fine to medium of brick and mixed natural lithologies. MADE GROUND
							End of pit at 0.85 m

1

2

3

4

5

Remarks: 1) No groundwater encountered. 2) Terminated due to pit collapsing.

Stability: Unstable





Trial Pit Log

Trialpit No

TPJ

Sheet 1 of 1

Project Name: The Manchester College

Project No.
TE1291Co-ords: -
Level:Date
10/08/2021

Location: Manchester

Dimensions
(m):Depth
1.00Scale
1:25Logged
AP

Client: Caddick Construction

Water Strike	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth	Type	Results				
	0.05	ES		0.10			MADE GROUND: Asphalt. MADE GROUND
	0.25	ES		0.50			MADE GROUND: Black, slightly silty, sandy to very sandy, angular to rounded, fine to coarse GRAVEL of concrete, asphalt, clinker and slate with a high proportion of ash. A low content of sandy concrete and clinker. MADE GROUND
	0.60	ES		0.70			MADE GROUND: Brown, slightly clayey, sandy to very sandy, angular to rounded, fine to medium GRAVEL of brick, coal, asphalt and mixed natural litholoiges. MADE GROUND
				0.90			MADE GROUND: Black, slightly silty, sandy to very sandy, angular to rounded, fine to coarse GRAVEL of concrete, asphalt, clinker and slate with a high proportion of ash. A low content of sandy concrete and clinker. MADE GROUND
				1.00			Firm, dark brown, sandy CLAY. (Possible made ground). End of pit at 1.00 m

1

2

3

4

5

Remarks: 1) No groundwater encountered. 2) Terminated at target depth.

Stability: Stable





APPENDIX C – CHEMICAL SAMPLING QA/QC

Samples were selected by a representative of Tier Environmental during the site investigation works in accordance with the sampling approach described elsewhere in this report.

Samples for chemical analysis

All samples for chemical analysis were placed into clean new containers as summarised in Table 1. Unless explicitly stated elsewhere in this report, no preservatives were used to eliminate the risk that preservatives cause contaminant dissolution or analytical interference. Containers for VOC analysis were fully filled to exclude headspace.

Soil samples were dispensed as soon as possible after collection using reusable stainless steel spatulas, trowels, or similar implements.

Ground water samples were collected from boreholes using single-use Teflon bailers or dedicated Waterra tubing with foot valves, except as otherwise noted within this report. Caution was taken to avoid excessive agitation during collection

New disposable gloves were used by the engineer for the collection of each sample.

Reusable equipment was washed down with distilled or deionised water between samples, except where tarry or similarly sticky materials were present. In such cases specific cleaning procedures were adopted as specifically described elsewhere in this report.

All sub-samples taken for chemical analysis were placed into refrigerators or cool boxes containing frozen ice packs immediately after aliquoting. All samples were transferred in cool boxes containing frozen ice packs to the relevant UKAS/MCERTS accredited laboratory as soon as possible. Recommended maximum holding times before analysis are summarised in Table 1.

Table 1. Sample containers and holding times.

Analysis	Container/special requirements	Max. holding time at 4°C before analysis
Soil and sediment samples		
VOCs	30-60 g brown or green glass jar with VOC-resistant cap and inert cap liner. Must be fully filled.	14 days
TPHCWG	30-60 g brown or green glass jar with VOC-resistant cap and inert cap liner PLUS 250-500 g brown or green glass jar with unwaxed cap liner. ¹ The former must be fully filled.	14 days
All other organics	250-500 g brown or green glass jar with unwaxed cap liner.	7 days
Inorganics	Air-tight 0.5-2.0 kg plastic container (250-500 g brown or green glass jar may also be used).	14 days ²
Water samples		
VOCs	40-50 ml glass vial with VOC resistant screw cap and inert liner. Must be fully filled.	14 days
TPHCWG	40-50 ml glass vial with VOC resistant screw cap and inert liner PLUS 500-1000 ml brown or green glass bottle with screw cap and unwaxed liner. ¹ The former must be fully filled, the latter should be filled if possible.	14 days
All other organics	500-1000 ml brown or green glass bottle with screw cap. Fill if possible.	7 days
Inorganics	500-1000 ml translucent or opaque screw cap plastic or brown or green glass bottles. Fill if possible.	14 days ³

¹ The smaller vessel is used for analysis of the volatile components within the TPH mixture and the larger one is for the non-volatile components.

2 14 days is set as a reasonable limit for all routine analyses of soil for those inorganic components vulnerable to chemical and/or biological breakdown. Samples for sulphate analysis are vulnerable to biological sulphate-reduction but can be held for up to 28 days. For total metals, a holding period of up to 6 months is acceptable.

3 14 days applies for all routine analyses of most inorganic components that may be vulnerable to chemical and/or biological reactions. In the specific cases of sulphide, nitrite, nitrate and phosphate analyses, storage time must not exceed 48 hours. For total metals, a holding time of up to 6 months is acceptable.

Tier Environmental standard analytical suites

The analyses included with Tier Environmental's standard analytical suites for soil, soil leachate and water samples are presented in Table 2. Other individual analyses were specified as described within this report.

Table 2. Tier Environmental Standard Analytical Suites.

Parameter	Sample type					
	Soil		Leachate ¹		Water	
		LoD ² (mg/kg or as stated)		LoD (µg/l or as stated)		LoD (µg/l or as stated)
Metals and metalloids						
Arsenic	✓	1	✓	10	✓	10
Cadmium	✓	1	✓	5	✓	5
Chromium	✓	1	✓	5	✓	5
Mercury	✓	1	✓	1	✓	1
Lead	✓	1	✓	4	✓	4
Selenium	✓	2	✓	10	✓	10
Copper	✓	1	✓	1	✓	1
Nickel	✓	1	✓	50	✓	50
Zinc	✓	1	✓	8	✓	8
Other inorganics						
Ammonia (as NH ₄ -N)					✓	15
Total sulphate	✓	100			✓	50 mg/l
Water-soluble sulphate	✓	0.1 g/l				
Hardness (as CaCO ₃)					✓	1 mg/l
Organics						
Monohydric phenol	✓	1	✓	0.5	✓	0.5
Speciated PAHs (USEPA 16)	✓	0.1	✓	0.01	✓	0.01
Total Organic Carbon	✓	0.1 wt%				
Others						
Electrical conductivity					✓	NA
pH	✓	NA	✓	NA	✓	NA

NA - Not applicable 1 Leachate preparation according to NRA (1994), 10:1 liquid to solid ratio. 2 The table presents the desired limit of detection for the analysis. Higher LoDs may be reported on analytical data sheets due to interference between analytes within specific samples or if the laboratory needed to dilute samples to achieve results within the calibrated range for that instrument.

Analytical QA procedures

Introduction

Quality Assurance (QA) is a system of review and audit that assesses the effectiveness of that product and assures the producer and user that defined standards of quality have been met. If we consider site investigation and chemical analysis, QA is the management system that ensures these measures are in place and working as intended.

QA within the laboratory form part of relevant certification programmes (such as UKAS and MCERTS) and, indeed, will be undertaken in some form by any reputable analyst, whether for a certified technique or not. Laboratory QA/QC is beyond the control of Tier Environmental and will not be considered further in this document, although the relevant laboratory documentation can be obtained upon request. QA must also form part of the design and execution of a site investigation.

Two parameters often used to assess measurement quality objectives are bias and precision. Bias is a systematic deviation in the data. For example, a positive bias (concentrations higher than in reality) would be introduced if sampling bottles were a source of the analyte and this fact was unknown. Precision is the variation in the measurements around a central 'expected' value. This could be due both to real variability in the environmental medium being measured and random errors in the analytical process. Both precision and bias can be assessed by the use of appropriate blanks and replicates within the site investigation programme.

The objectives of the QA activities undertaken in this present site investigation were to recognise and quantify systematic bias within the analytical dataset and to obtain an indication of precision. In environmental samples, much of the observed variability is likely to result from heterogeneity in the sampled medium, particularly for soil and sediment samples.

Such QA practice within the sampling programme is required by current guidance (e.g., Environment Agency report P5-065/TR (2000); Environment Agency LFTGN02 (2002); BS 10175:2001).

Alternative QA procedures to the generic approach presented in this appendix may be specified for a project, provided case-specific justification is given.

QA checking procedure (data validation)

The responsible Engineer and Project Reviewer are required to undertake data validation and provide comment on data quality within the main body of the report(s) issued, when noteworthy matters arise. This QA checking should involve:

Confirming that data reported by the laboratory have achieved the standards specified by the certification scheme (MCERTS or UKAS). This will be indicated on the analytical certificates issued by the laboratory.

Checking that the limit of detection (LoD) and limit of quantification (LoQ) achieved by the laboratory for an individual analyte is appropriate for the purposes of the report. LoD and LoQ will vary dependent upon analyte concentrations, sample matrix properties and interference from co-contaminants.

A check that the reported range of concentrations are reasonable for the analyte. For example, the dissolved concentration of an analyte in a water sample should not exceed saturation. If it does, then this merits further consideration (e.g., was colloidal organic matter or other solid-phase material present or could there have been unobserved free-phase organic liquid?) and explicit comment. At its simplest, there may be a unit error.

Where analysis involves reporting of Tentatively Identified Compounds (TICs; normally by mass spectrometry), the reviewers should check that these might reasonably be expected at the site under consideration. The uncertainties in identification by MS mean that it is not uncommon that TICs are incorrectly assigned. In cases of doubt, the analytical laboratory can re-check the raw data and confirm.

A review of the analytical precision by comparing data obtained for duplicate samples. There is no absolute threshold - variability is entirely dependent upon the sample matrix and manner in which the contaminant has entered the sample. Variability that cannot reasonably be assigned to such factors (for example a very high apparent variability in data for sediment-free water samples) should be reviewed with the laboratory. Variability that is attributable to the sample matrix can nevertheless provide important pointers to improve understanding of contaminant transport pathways and the risks posed by pollutant linkages (e.g., soil heterogeneity, the association of contamination with particular soil fractions, the presence of residual NAPL within soil pores or the role of suspended sediments in contaminant transport).

Confirmation that no errors have been introduced by data transcription, unit conversion or corrections between preliminary and certificates issued by the laboratory. The reviewer should audit a proportion (typically 5-10%) of all data from the original (final) certificates of analysis through to the equivalent values in the report for those specific samples.

It is important to consult the analytical laboratory if apparent QA issues arise. Many apparent concerns can be adequately resolved on the basis of revisiting the raw analytical data or by obtaining a better understanding of the inherent limitations of the analysis for a particular matrix or sample type.



APPENDIX D – GEOENVIRONMENTAL SOIL LABORATORY RESULTS

Tier Environmental
Suite 513, Chadwick House
Warrington Rd
Birchwood
Warrington
WA3 6AE



Attention :	Alex Preston
Date :	7th September, 2021
Your reference :	TE1291
Our reference :	Test Report 21/11993 Batch 2
Location :	Manchester College
Date samples received :	10th August, 2021
Status :	Final Report
Issue :	1

Twelve samples were received for analysis on 10th August, 2021 of which eleven 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:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston
EMT Job No: 21/11993

Report : Solid

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

EMT Sample No.	24-26	28-30	34-36	37-39	41	42-44					Please see attached notes for all abbreviations and acronyms		
Sample ID	TPA	TPF	TPE	TPI	TPJ	TPJ							
Depth	0.50	0.70	0.75	0.20	0.05	0.25							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	T	V J T							
Sample Date	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	2	2	2	2	2	2							
Date of Receipt	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021					LOD/LOR	Units	Method No.
Arsenic #	NDP	18.8	NDP	0.8	-	NDP					<0.5	mg/kg	TM30/PM15
Cadmium #	NDP	<0.1	NDP	0.9	-	NDP					<0.1	mg/kg	TM30/PM15
Chromium #	NDP	52.5	NDP	13.0	-	NDP					<0.5	mg/kg	TM30/PM15
Copper #	NDP	53	NDP	3	-	NDP					<1	mg/kg	TM30/PM15
Lead #	NDP	41	NDP	21	-	NDP					<5	mg/kg	TM30/PM15
Mercury #	NDP	0.2	NDP	<0.1	-	NDP					<0.1	mg/kg	TM30/PM15
Nickel #	NDP	46.3	NDP	1.7	-	NDP					<0.7	mg/kg	TM30/PM15
Selenium #	NDP	<1	NDP	<1	-	NDP					<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	NDP	533	NDP	91	-	NDP					<50	mg/kg	TM50/PM29
Zinc #	NDP	61	NDP	28	-	NDP					<5	mg/kg	TM30/PM15
Arsenic	17.2	-	43.2	-	-	14.7					<0.5	mg/kg	TM30/PM62
Cadmium	0.6	-	0.2	-	-	0.3					<0.1	mg/kg	TM30/PM62
Chromium	42.0	-	22.9	-	-	16.9					<0.5	mg/kg	TM30/PM62
Copper	146	-	92	-	-	68					<1	mg/kg	TM30/PM62
Lead	257	-	142	-	-	32					<5	mg/kg	TM30/PM62
Mercury	<0.1	-	<0.1	-	-	<0.1					<0.1	mg/kg	TM30/PM62
Nickel	67.2	-	57.5	-	-	46.0					<0.7	mg/kg	TM30/PM62
Selenium	2	-	2	-	-	<1					<1	mg/kg	TM30/PM62
Total Sulphate as SO4	667	-	1042	-	-	312					<50	mg/kg	TM50/PM129
Zinc	200	-	247	-	-	39					<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #	0.54	1.54	<0.40 ^{AA}	<0.04	-	<0.04					<0.04	mg/kg	TM4/PM8
Acenaphthylene	1.84	0.49	0.88 ^{AA}	0.05	-	<0.03					<0.03	mg/kg	TM4/PM8
Acenaphthene #	1.67	3.33	3.05 ^{AA}	0.09	-	<0.05					<0.05	mg/kg	TM4/PM8
Fluorene #	2.51	2.49	3.25 ^{AA}	0.07	-	<0.04					<0.04	mg/kg	TM4/PM8
Phenanthrene #	21.95	20.08	25.80 ^{AA}	0.89	-	0.13					<0.03	mg/kg	TM4/PM8
Anthracene #	11.47	4.77	9.12 ^{AA}	0.26	-	<0.04					<0.04	mg/kg	TM4/PM8
Fluoranthene #	50.18	25.91	48.62 ^{AA}	1.57	-	0.20					<0.03	mg/kg	TM4/PM8
Pyrene #	43.25	25.12	39.83 ^{AA}	1.38	-	0.19					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	18.74	10.87	16.08 ^{AA}	0.91	-	0.14					<0.06	mg/kg	TM4/PM8
Chrysene #	19.60	13.33	15.38 ^{AA}	0.73	-	0.13					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	32.73	18.57	26.05 ^{AA}	1.19	-	0.23					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	18.84	11.01	14.40 ^{AA}	0.67	-	0.11					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	10.44	5.81	8.54 ^{AA}	0.36	-	0.08					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	2.43	1.62	1.46 ^{AA}	0.09	-	<0.04					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	10.19	6.73	8.93 ^{AA}	0.40	-	0.09					<0.04	mg/kg	TM4/PM8
Coronene	1.81	-	-	0.06	-	-					<0.04	mg/kg	TM4/PM8
PAH 16 Total	246.4	151.7	221.4 ^{AA}	8.7	-	1.3					<0.6	mg/kg	TM4/PM8
PAH 17 Total	248.19	-	-	8.72	-	-					<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	23.57	13.37	18.76 ^{AA}	0.86	-	0.17					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	9.16	5.20	7.29 ^{AA}	0.33	-	0.06					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	97	93	115 ^{AA}	95	-	103					<0	%	TM4/PM8

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston
EMT Job No: 21/11993

Report : Solid

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

EMT Sample No.	24-26	28-30	34-36	37-39	41	42-44					Please see attached notes for all abbreviations and acronyms		
Sample ID	TPA	TPF	TPE	TPI	TPJ	TPJ							
Depth	0.50	0.70	0.75	0.20	0.05	0.25							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	T	V J T							
Sample Date	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	2	2	2	2	2	2							
Date of Receipt	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021	10/08/2021					LOD/LOR	Units	Method No.
PAH MS													
Naphthalene	-	-	-	-	0.07	-					<0.04	mg/kg	TM4/PM6
Acenaphthylene	-	-	-	-	0.03	-					<0.03	mg/kg	TM4/PM6
Acenaphthene	-	-	-	-	0.07	-					<0.05	mg/kg	TM4/PM6
Fluorene	-	-	-	-	0.06	-					<0.04	mg/kg	TM4/PM6
Phenanthrene	-	-	-	-	0.31	-					<0.03	mg/kg	TM4/PM6
Anthracene	-	-	-	-	0.22	-					<0.04	mg/kg	TM4/PM6
Fluoranthene	-	-	-	-	0.31	-					<0.03	mg/kg	TM4/PM6
Pyrene	-	-	-	-	0.44	-					<0.03	mg/kg	TM4/PM6
Benzo(a)anthracene	-	-	-	-	0.15	-					<0.06	mg/kg	TM4/PM6
Chrysene	-	-	-	-	0.90	-					<0.02	mg/kg	TM4/PM6
Benzo(b)fluoranthene	-	-	-	-	0.43	-					<0.07	mg/kg	TM4/PM6
Benzo(a)pyrene	-	-	-	-	0.22	-					<0.04	mg/kg	TM4/PM6
Indeno(123cd)pyrene	-	-	-	-	0.10	-					<0.04	mg/kg	TM4/PM6
Dibenzo(ah)anthracene	-	-	-	-	0.07	-					<0.04	mg/kg	TM4/PM6
Benzo(ghi)perylene	-	-	-	-	0.26	-					<0.04	mg/kg	TM4/PM6
PAH 16 Total	-	-	-	-	3.6	-					<0.6	mg/kg	TM4/PM6
Benzo(b)fluoranthene	-	-	-	-	0.31	-					<0.05	mg/kg	TM4/PM6
Benzo(k)fluoranthene	-	-	-	-	0.12	-					<0.02	mg/kg	TM4/PM6
Mineral Oil (C10-C40) (EH_CU_1D_AL)	288	-	-	<30	-	-					<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2	-	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	5	<4	<4	-	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	14	20	11	<7	-	27					<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	242	64	143	<7	-	305					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	256	89	154	<19	-	332					<19	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1 ^{SV}	<0.1	-	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	0.9	2.1	<0.2	-	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	5	22	13	<4	-	170					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	66	180	108	<7	-	1647					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	549	396	357	35	-	2202					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	620	599	480	35	-	4019					<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-35) (EH+HS_CU_1D_Total)	876	688	634	<38	-	4351					<38	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5 ^{SV}	<5 ^{SV}	<5	-	<5					<5	ug/kg	TM36/PM12

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston
EMT Job No: 21/11993

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

Please see attached notes for all abbreviations and acronyms

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	15.3
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	86.7
Particle Size <4mm =	>95%		
EMT Job No	21/11993	Landfill Waste Acceptance Criteria Limits	
Sample No	26		
Client Sample No	TPA		
Depth/Other	0.50		
Sample Date	10/08/2021		
Batch No	2		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	-	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	288	500	-
PAH Sum of 17(mg/kg)	248.19	100	-
pH (pH Units)	8.36	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.42	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	0.0042	0.042	0.5
Barium	0.062	0.62	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	0.001	<0.01	0.01
Molybdenum	0.014	0.14	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	0.012	0.12	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	1.0	10	10
Sulphate as SO ₄	23.5	235	1000
Total Dissolved Solids	79	790	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	2	<20	500

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	<0.1
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	100.3
Particle Size <4mm =	>95%		
EMT Job No	21/11993	Landfill Waste Acceptance Criteria Limits	
Sample No	39		
Client Sample No	TPI		
Depth/Other	0.20		
Sample Date	10/08/2021		
Batch No	2		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	0.07	3	5
Loss on Ignition (%)	<1.0	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	<30	500	-
PAH Sum of 17(mg/kg)	8.72	100	-
pH (pH Units)	9.27	-	>6
ANC to pH 7 (mol/kg)	0.05	-	to be evaluated
ANC to pH 4 (mol/kg)	1.58	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	<0.0025	<0.025	0.5
Barium	0.006	0.06	20
Cadmium	<0.0005	<0.005	0.04
Chromium	<0.0015	<0.015	0.5
Copper	<0.007	<0.07	2
Mercury	<0.001	<0.01	0.01
Molybdenum	<0.002	<0.02	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	<0.3	<3	800
Fluoride	<0.3	<3	10
Sulphate as SO ₄	1.9	19	1000
Total Dissolved Solids	<35	<350	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston

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). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

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

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/11/1993	2	TPA	0.30	23	18/08/2021	General Description (Bulk Analysis)	board
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos ACM	Asbestos Insulating Board
					18/08/2021	Asbestos Type	Amosite
					18/08/2021	Asbestos Level Screen	Asbestos level cannot be determined from Screen. Quantification required.
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	26.817 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	26.817 (mass %)
					25/08/2021	Asbestos PCOM Quantification (Fibres)	NDP (mass %)
					25/08/2021	Asbestos Gravimetric & PCOM Total	NDP (mass %)
21/11/1993	2	TPA	0.50	26	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos Fibres (2)	Fibre Bundles
					18/08/2021	Asbestos ACM	ACM Debris
					18/08/2021	Asbestos ACM (2)	ACM Debris
					18/08/2021	Asbestos Type	Chrysotile
					18/08/2021	Asbestos Type (2)	Amosite
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	0.006 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.006 (mass %)
					26/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					26/08/2021	Asbestos Gravimetric & PCOM Total	0.006 (mass %)
21/11/1993	2	TPF	0.20	27	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11/1993	2	TPF	0.70	30	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11/1993	2	TPE	0.15	33	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	NAD

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/11993	2	TPE	0.15	33	18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11993	2	TPE	0.75	36	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	Amosite
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					26/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					26/08/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
21/11993	2	TPI	0.20	39	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11993	2	TPI	0.60	40	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	Chrysotile
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	0.002 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.002 (mass %)
					27/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					27/08/2021	Asbestos Gravimetric & PCOM Total	0.002 (mass %)
21/11993	2	TPJ	0.25	44	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos ACM	ACM Debris
					18/08/2021	Asbestos Type	Chrysotile
					18/08/2021	Asbestos Level Screen	Asbestos level cannot be determined from Screen. Quantification required.
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	0.072 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.072 (mass %)
					27/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					27/08/2021	Asbestos Gravimetric & PCOM Total	0.072 (mass %)
21/11993	2	TPJ	0.60	45	18/08/2021	General Description (Bulk Analysis)	soil
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	Chrysotile
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					27/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					27/08/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)

Matrix : Solid

[illegible]

Client Name: Tier Environmental **Matrix :** Solid

Reference: TE1291

Location: Manchester College

Contact: Alex Preston

[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.: 21/11993

SOILS

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.

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.

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.

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.

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.

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	x10 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: 21/11993

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	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs 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
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.			AR	Yes
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
TM7	Modified USEPA 3540C:1996 and 9071B:1998 for oily wastes. In house method for the gravimetric determination of a sample following solvent extraction.	PM6	Samples are extracted using Soxtec apparatus and solvent.	Yes		AR	Yes
TM13	Determination of Saturates, Aromatics, Resins and Asphaltenes by Thin Layer Chromatography with Flame Ionisation Detection.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes

EMT Job No: 21/11993

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
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners 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
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			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 CO ₂ 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
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	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
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	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes

EMT Job No: 21/11993

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 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: 2013I	PM0	No preparation is required.	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.	Yes		AD	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
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	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM129	A hot hydrochloric acid digest is performed on an as received sample, and the resulting liquor is analysed.			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
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	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	

EMT Job No: 21/11993

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
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
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM131	Quantification of Asbestos Fibres and ACM based on HSG248 First edition:2006, 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
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	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.			AR	

Tier Environmental
Suite 513, Chadwick House
Warrington Rd
Birchwood
Warrington
WA3 6AE



Attention :	Alex Preston
Date :	3rd September, 2021
Your reference :	TE1291
Our reference :	Test Report 21/11993 Batch 1
Location :	Manchester College
Date samples received :	6th August, 2021
Status :	Final Report
Issue :	1

Twelve samples were received for analysis on 6th August, 2021 of which twelve 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:



Phil Sommerton BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston
EMT Job No: 21/11993

Report : Solid

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

EMT Sample No.	2-4	6-8	9	10-12	14	15-17	20-22				Please see attached notes for all abbreviations and acronyms		
Sample ID	TPB	TPC	TPD	TPD	TPG	TPG	TPH						
Depth	0.50	0.80	0.05	0.25	0.05	0.25	0.40						
COC No / misc													
Containers	V J T	V J T	T	V J T	T	J T	J T						
Sample Date	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021				LOD/LOR	Units	Method No.
Arsenic #	NDP	10.6	-	12.0	-	NDP	NDP				<0.5	mg/kg	TM30/PM15
Cadmium #	NDP	0.1	-	0.1	-	NDP	NDP				<0.1	mg/kg	TM30/PM15
Chromium #	NDP	46.8	-	62.6	-	NDP	NDP				<0.5	mg/kg	TM30/PM15
Copper #	NDP	24	-	58	-	NDP	NDP				<1	mg/kg	TM30/PM15
Lead #	NDP	24	-	51	-	NDP	NDP				<5	mg/kg	TM30/PM15
Mercury #	NDP	<0.1	-	<0.1	-	NDP	NDP				<0.1	mg/kg	TM30/PM15
Nickel #	NDP	38.8	-	45.4	-	NDP	NDP				<0.7	mg/kg	TM30/PM15
Selenium #	NDP	<1	-	<1	-	NDP	NDP				<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #	NDP	234	-	268	-	NDP	NDP				<50	mg/kg	TM50/PM29
Zinc #	NDP	74	-	49	-	NDP	NDP				<5	mg/kg	TM30/PM15
Arsenic	35.6	-	-	-	-	23.6	27.9				<0.5	mg/kg	TM30/PM62
Cadmium	0.7	-	-	-	-	0.6	0.5				<0.1	mg/kg	TM30/PM62
Chromium	28.0	-	-	-	-	189.4	215.0				<0.5	mg/kg	TM30/PM62
Copper	167	-	-	-	-	256	339 ^{AA}				<1	mg/kg	TM30/PM62
Lead	270	-	-	-	-	269	161				<5	mg/kg	TM30/PM62
Mercury	0.3	-	-	-	-	<0.1	<0.1				<0.1	mg/kg	TM30/PM62
Nickel	61.6	-	-	-	-	200.8	268.7				<0.7	mg/kg	TM30/PM62
Selenium	2	-	-	-	-	7	6				<1	mg/kg	TM30/PM62
Total Sulphate as SO4	2450	-	-	-	-	815	390				<50	mg/kg	TM50/PM129
Zinc	171	-	-	-	-	423	214				<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #	0.22	<0.04	-	0.33 ^{AA}	-	2.02	0.38 ^{AA}				<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.50	<0.03	-	0.67 ^{AA}	-	3.12	1.72 ^{AA}				<0.03	mg/kg	TM4/PM8
Acenaphthene #	2.50	<0.05	-	3.54 ^{AA}	-	2.73	16.80 ^{AA}				<0.05	mg/kg	TM4/PM8
Fluorene #	2.48	<0.04	-	3.87 ^{AA}	-	2.40	13.37 ^{AA}				<0.04	mg/kg	TM4/PM8
Phenanthrene #	14.61	0.54	-	26.55 ^{AA}	-	27.18	72.34 ^{AA}				<0.03	mg/kg	TM4/PM8
Anthracene #	6.15	0.13	-	10.70 ^{AA}	-	15.24	26.91 ^{AA}				<0.04	mg/kg	TM4/PM8
Fluoranthene #	18.68	0.71	-	35.77 ^{AA}	-	65.59	85.88 ^{AA}				<0.03	mg/kg	TM4/PM8
Pyrene #	14.87	0.60	-	29.71 ^{AA}	-	50.11	72.69 ^{AA}				<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	5.00	0.28	-	15.57 ^{AA}	-	30.90	31.66 ^{AA}				<0.06	mg/kg	TM4/PM8
Chrysene #	4.95	0.27	-	12.06 ^{AA}	-	22.51	25.98 ^{AA}				<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	8.79	0.44	-	19.81 ^{AA}	-	47.88	45.79 ^{AA}				<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	4.77	0.21	-	11.26 ^{AA}	-	19.75	25.57 ^{AA}				<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	3.30	0.14	-	6.10 ^{AA}	-	14.94	14.43 ^{AA}				<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.53	<0.04	-	1.08 ^{AA}	-	2.42	2.47 ^{AA}				<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	3.41	0.15	-	6.24 ^{AA}	-	13.72	13.40 ^{AA}				<0.04	mg/kg	TM4/PM8
Coronene	-	-	-	-	-	-	2.23 ^{AA}				<0.04	mg/kg	TM4/PM8
PAH 16 Total	90.8	3.5	-	183.3 ^{AA}	-	320.5	449.4 ^{AA}				<0.6	mg/kg	TM4/PM8
PAH 17 Total	-	-	-	-	-	-	451.62 ^{AA}				<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	6.33	0.32	-	14.26 ^{AA}	-	34.47	32.97 ^{AA}				<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	2.46	0.12	-	5.55 ^{AA}	-	13.41	12.82 ^{AA}				<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	88	73	-	89 ^{AA}	-	89	94 ^{AA}				<0	%	TM4/PM8

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston
EMT Job No: 21/11993

Report : Solid

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

EMT Sample No.	2-4	6-8	9	10-12	14	15-17	20-22				Please see attached notes for all abbreviations and acronyms		
Sample ID	TPB	TPC	TPD	TPD	TPG	TPG	TPH						
Depth	0.50	0.80	0.05	0.25	0.05	0.25	0.40						
COC No / misc													
Containers	V J T	V J T	T	V J T	T	J T	J T						
Sample Date	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021				LOD/LOR	Units	Method No.
PAH MS													
Naphthalene	-	-	0.07	-	0.90 _{AB}	-	-				<0.04	mg/kg	TM4/PM6
Acenaphthylene	-	-	2.85	-	18.48 _{AB}	-	-				<0.03	mg/kg	TM4/PM6
Acenaphthene	-	-	5.92	-	149.20 _{AB}	-	-				<0.05	mg/kg	TM4/PM6
Fluorene	-	-	4.65	-	200.02 _{AB}	-	-				<0.04	mg/kg	TM4/PM6
Phenanthrene	-	-	17.01	-	1553.58 _{AB}	-	-				<0.03	mg/kg	TM4/PM6
Anthracene	-	-	14.43	-	617.81 _{AB}	-	-				<0.04	mg/kg	TM4/PM6
Fluoranthene	-	-	60.12	-	1686.61 _{AB}	-	-				<0.03	mg/kg	TM4/PM6
Pyrene	-	-	62.65	-	1244.11 _{AB}	-	-				<0.03	mg/kg	TM4/PM6
Benzo(a)anthracene	-	-	21.15	-	413.14 _{AB}	-	-				<0.06	mg/kg	TM4/PM6
Chrysene	-	-	23.86	-	417.34 _{AB}	-	-				<0.02	mg/kg	TM4/PM6
Benzo(b)fluoranthene	-	-	33.39	-	571.42 _{AB}	-	-				<0.07	mg/kg	TM4/PM6
Benzo(a)pyrene	-	-	20.10	-	313.22 _{AB}	-	-				<0.04	mg/kg	TM4/PM6
Indeno(123cd)pyrene	-	-	9.05	-	184.83 _{AB}	-	-				<0.04	mg/kg	TM4/PM6
Dibenzo(ah)anthracene	-	-	1.70	-	24.63 _{AB}	-	-				<0.04	mg/kg	TM4/PM6
Benzo(ghi)perylene	-	-	7.80	-	153.66 _{AB}	-	-				<0.04	mg/kg	TM4/PM6
PAH 16 Total	-	-	284.8	-	7549.0 _{AB}	-	-				<0.6	mg/kg	TM4/PM6
Benzo(b)fluoranthene	-	-	24.04	-	411.42 _{AB}	-	-				<0.05	mg/kg	TM4/PM6
Benzo(k)fluoranthene	-	-	9.35	-	160.00 _{AB}	-	-				<0.02	mg/kg	TM4/PM6
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	-	-	-	-	365				<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1 ^{SV}	<0.1	-	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}				<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1 ^{SV}	<0.1	-	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}				<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1 ^{SV}	<0.1	-	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}				<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	-	<0.2	-	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	14	<4	-	<4	-	<4	6				<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	63	<7	-	21	-	12	41				<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	262	<7	-	167	-	97	286				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	339	<19	-	188	-	109	333				<19	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	-	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}				<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	-	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}				<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1 ^{SV}	<0.1	-	<0.1	-	<0.1 ^{SV}	<0.1 ^{SV}				<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	-	<0.2	-	3.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	17	<4	-	38	-	18	37				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	169	<7	-	356	-	482	396				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	485	<7	-	566	-	741	753				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	671	<19	-	960	-	1244	1186				<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-35) (EH+HS_CU_1D_Total)	1010	<38	-	1148	-	1353	1519				<38	mg/kg	TM5/PM8/PM16
MTBE #	<5 ^{SV}	<5	-	<5	-	<5 ^{SV}	<5 ^{SV}				<5	ug/kg	TM36/PM12

Element Materials Technology

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston
EMT Job No: 21/11993

Report : Solid

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

EMT Sample No.	2-4	6-8	9	10-12	14	15-17	20-22				Please see attached notes for all abbreviations and acronyms		
Sample ID	TPB	TPC	TPD	TPD	TPG	TPG	TPH						
Depth	0.50	0.80	0.05	0.25	0.05	0.25	0.40						
COC No / misc													
Containers	V J T	V J T	T	V J T	T	J T	J T						
Sample Date	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021	05/08/2021						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021	06/08/2021				LOD/LOR	Units	Method No.
Benzene #	<5 ^{SV}	<5	-	<5	-	12 ^{SV}	<5 ^{SV}				<5	ug/kg	TM36/PM12
Toluene #	<5 ^{SV}	<5	-	7	-	9 ^{SV}	<5 ^{SV}				<5	ug/kg	TM36/PM12
Ethylbenzene #	<5 ^{SV}	<5	-	<5	-	<5 ^{SV}	<5 ^{SV}				<5	ug/kg	TM36/PM12
m/p-Xylene #	<5 ^{SV}	<5	-	7	-	8 ^{SV}	<5 ^{SV}				<5	ug/kg	TM36/PM12
o-Xylene #	<5 ^{SV}	<5	-	<5	-	<5 ^{SV}	<5 ^{SV}				<5	ug/kg	TM36/PM12
PCB 28 #	-	-	-	-	-	-	<5				<5	ug/kg	TM17/PM8
PCB 52 #	-	-	-	-	-	-	<5				<5	ug/kg	TM17/PM8
PCB 101 #	-	-	-	-	-	-	<5				<5	ug/kg	TM17/PM8
PCB 118 #	-	-	-	-	-	-	<5				<5	ug/kg	TM17/PM8
PCB 138 #	-	-	-	-	-	-	<5				<5	ug/kg	TM17/PM8
PCB 153 #	-	-	-	-	-	-	<5				<5	ug/kg	TM17/PM8
PCB 180 #	-	-	-	-	-	-	<5				<5	ug/kg	TM17/PM8
Total 7 PCBs #	-	-	-	-	-	-	<35				<35	ug/kg	TM17/PM8
Total Phenols HPLC	<0.15	<0.15	-	<0.15	-	<0.15	<0.15				<0.15	mg/kg	TM26/PM21B
SEM #	-	-	27638	-	32453	-	-				<110	mg/kg	TM7/PM6
Saturates (Aliphatics)	-	-	18.72	-	2.52	-	-				<0.01	%	TM13/PM6
Aromatics	-	-	10.97	-	55.08	-	-				<0.01	%	TM13/PM6
Resins (Heterocyclics)	-	-	61.58	-	39.96	-	-				<0.01	%	TM13/PM6
Asphaltenes	-	-	8.73	-	2.44	-	-				<0.01	%	TM13/PM6
Natural Moisture Content	15.3	28.3	0.5	15.3	0.5	18.6	14.8				<0.1	%	PM4/PM0
Triterpanes 191m/z	-	-	Present	-	Absent	-	-				None		TM16/PM6
Triaromatic Steranes 231m/z	-	-	Present	-	Absent	-	-				None		TM16/PM6
Coal Tar	-	-	<0.1	-	0.9	-	-				<0.1	%	TM16/PM6
Hexavalent Chromium #	<0.3	<0.3	-	<0.3	-	<0.3	<0.3				<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	NDP	0.0354	-	0.0238	-	NDP	NDP				<0.0015	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)	0.1892	-	-	-	-	0.0198	0.0140				<0.0015	g/l	TM38/PM60
Total Organic Carbon #	NDP	1.12	-	7.52	-	NDP	NDP				<0.02	%	TM21/PM24
ANC at pH4	-	-	-	-	-	-	0.32				<0.03	mol/kg	TM77/PM0
ANC at pH7	-	-	-	-	-	-	NDP				<0.03	mol/kg	TM77/PM0
pH #	10.23	8.46	-	8.82	-	8.35	8.69				<0.01	pH units	TM73/PM11

Mass of sample taken (kg)	-	Moisture Content Ratio (%) =	17.8
Mass of dry sample (kg) =	0.09	Dry Matter Content Ratio (%) =	84.9
Particle Size <4mm =	>95%		
EMT Job No	21/11993	Landfill Waste Acceptance Criteria Limits	
Sample No	22		
Client Sample No	TPH		
Depth/Other	0.40		
Sample Date	05/08/2021		
Batch No	1		
Solid Waste Analysis		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill
Total Organic Carbon (%)	-	3	5
Loss on Ignition (%)	-	-	10
Sum of BTEX (mg/kg)	<0.025	6	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-
Mineral Oil (mg/kg) (EH_CU_1D_AL)	365	500	-
PAH Sum of 17(mg/kg)	451.62	100	-
pH (pH Units)	8.69	-	>6
ANC to pH 7 (mol/kg)	NDP	-	to be evaluated
ANC to pH 4 (mol/kg)	0.32	-	to be evaluated
Eluate Analysis	10:1 conc ⁿ leached		Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg
	C ₁₀ mg/l	A ₁₀ mg/kg	
Arsenic	0.0058	0.058	0.5
Barium	0.104	1.04	20
Cadmium	<0.0005	<0.005	0.04
Chromium	0.0030	0.030	0.5
Copper	<0.007	<0.07	2
Mercury	0.004	0.04	0.01
Molybdenum	0.004	0.04	0.5
Nickel	<0.002	<0.02	0.4
Lead	<0.005	<0.05	0.5
Antimony	<0.002	<0.02	0.06
Selenium	<0.003	<0.03	0.1
Zinc	<0.003	<0.03	4
Chloride	0.4	4	800
Fluoride	1.0	10	10
Sulphate as SO ₄	5.6	56	1000
Total Dissolved Solids	58	580	4000
Phenol	<0.01	<0.1	1
Dissolved Organic Carbon	3	30	500

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston

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). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

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

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/11/1993	1	TPB	0.20	1	18/08/2021	General Description (Bulk Analysis)	Soil/Stone
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos Fibres (2)	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos ACM (2)	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Type (2)	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11/1993	1	TPB	0.50	4	18/08/2021	General Description (Bulk Analysis)	soil/stone
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos ACM	Fibrous board
					18/08/2021	Asbestos Type	Chrysotile
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	0.005 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	0.005 (mass %)
					26/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					26/08/2021	Asbestos Gravimetric & PCOM Total	0.005 (mass %)
21/11/1993	1	TPC	0.20	5	18/08/2021	General Description (Bulk Analysis)	soil/stone
					18/08/2021	Asbestos Fibres	Free Fibres
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	Amosite
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					26/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					26/08/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)
21/11/1993	1	TPC	0.80	8	18/08/2021	General Description (Bulk Analysis)	soil/stone
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11/1993	1	TPD	0.25	12	18/08/2021	General Description (Bulk Analysis)	soil/stone
					18/08/2021	Asbestos Fibres	NAD

Client Name: Tier Environmental
Reference: TE1291
Location: Manchester College
Contact: Alex Preston

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/11993	1	TPD	0.25	12	18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11993	1	TPD	0.65	13	18/08/2021	General Description (Bulk Analysis)	Soil/Stone
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos Fibres (2)	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos ACM (2)	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Type (2)	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11993	1	TPG	0.25	17	18/08/2021	General Description (Bulk Analysis)	soil/stone
					18/08/2021	Asbestos Fibres	Free Fibres
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	Chrysotile
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					26/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
21/11993	1	TPG	0.75	18	18/08/2021	General Description (Bulk Analysis)	Soil/Stone
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos Fibres (2)	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos ACM (2)	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Type (2)	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11993	1	TPH	0.20	19	18/08/2021	General Description (Bulk Analysis)	Soil/Stone
					18/08/2021	Asbestos Fibres	NAD
					18/08/2021	Asbestos Fibres (2)	NAD
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos ACM (2)	NAD
					18/08/2021	Asbestos Type	NAD
					18/08/2021	Asbestos Type (2)	NAD
					18/08/2021	Asbestos Level Screen	NAD
21/11993	1	TPH	0.40	22	18/08/2021	General Description (Bulk Analysis)	Soil/Stone
					18/08/2021	Asbestos Fibres	Fibre Bundles
					18/08/2021	Asbestos ACM	NAD
					18/08/2021	Asbestos Type	Chrysotile
					18/08/2021	Asbestos Level Screen	less than 0.1%
					24/08/2021	Total ACM Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Detailed Gravimetric Quantification (% Asb)	<0.001 (mass %)
					24/08/2021	Total Gravimetric Quantification (ACM + Detailed) (% Asb)	<0.001 (mass %)
					26/08/2021	Asbestos PCOM Quantification (Fibres)	<0.001 (mass %)
					26/08/2021	Asbestos Gravimetric & PCOM Total	<0.001 (mass %)

Matrix : Solid

8 of 16

Matrix : Solid

Reference: TE1291

Location: Manchester College

Contact: Alex Preston

[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.: 21/11993

SOILS

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.

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.

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.

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.

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.

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	x20 Dilution
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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: 21/11993

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	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs 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
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.			AR	Yes
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
TM7	Modified USEPA 3540C:1996 and 9071B:1998 for oily wastes. In house method for the gravimetric determination of a sample following solvent extraction.	PM6	Samples are extracted using Soxtec apparatus and solvent.	Yes		AR	Yes
TM13	Determination of Saturates, Aromatics, Resins and Asphaltenes by Thin Layer Chromatography with Flame Ionisation Detection.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes

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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
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM16	Modified USEPA 8270D v5:2014. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners 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
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.			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
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	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
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	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			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.			AR	Yes

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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	PM0	No preparation is required.	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.	Yes		AD	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
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	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM129	A hot hydrochloric acid digest is performed on an as received sample, and the resulting liquor is analysed.			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
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	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

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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
TM77	Modified DDCEN/TS method 15364:2006. Determination of Acid Neutralization Capacity by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	No
TM131	Quantification of Asbestos Fibres and ACM based on HSG248 First edition:2006, 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
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified			AR	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	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.			AR	

APPENDIX E – CONTROL OF ASBESTOS REGULATIONS (CAR) 2012

Complying with Control of Asbestos Regulations (CAR): Risk Assessments, Licensing and Training

This appendix outlines CAR risk assessments and where they should be applied in relation to assessing and remediating brownfield sites. The information below details the different classifications of work with asbestos under CAR, summarises the legal requirements for asbestos awareness training for all involved in the investigation and management of asbestos containing soil (ACS), and details the potential requirements for suitable proficiency training relating specifically to ACS.

CAR RISK ASSESSMENTS

A CAR Risk Assessment is required for any work which may expose employees to asbestos. It is recommended that a precautionary approach is adopted if there is any doubt about risks associated with asbestos.

There are three main activities for potential asbestos exposure during work on brownfield sites:

- Site reconnaissance visits;
- Site investigation works; and
- Site remediation.

CAR risk assessments are needed at each stage but may be incorporated during the site investigation stage into the overarching health and safety risk assessments.

The CAR risk assessment must:

- Identify the type of asbestos to which employees are liable to be exposed, where possible, or assume it is present in different forms;
- Determine the type and extent of exposures to asbestos that may occur during the work
- Identify the steps to be taken to prevent exposure or reduce it to the lowest level reasonably practicable; and,
- Consider the effects of control measures that have been or will be taken.

The CAR risk assessment should include any information used to inform the risk assessment such as asbestos reports or desk study information. In the event that this information is not available, the assessor should be assumed that all forms of asbestos may be present on Site.

For all investigation and remediation of ACSs, a detailed written work plan should be produced and followed as detailed on the HSE website and in the CAR.

The CAR risk assessments for specific investigations or remediation projects, will determine whether or not work is 'licensable work' (LW), notifiable non-licensable work' (NNLW) or 'non-licensed work' (NLW). In addition, training requirements are also defined by the CAR risk assessment.

Some examples of control measures that apply during site reconnaissance, site investigation works, and site remediation are given below and should be applied depending on the asbestos risks identified for the Site at each stage of investigation:

- Avoiding stirring up dust;
- Cleaning footwear after site works;
- Removing and bagging any overalls for disposal/laundry;
- Respirators and hygiene facilities for high risk sites;
- Segregated welfare units;
- Wetting ground
- Minimising soil disturbances;
- Implementation or retention of capping/break layers;
- Implementation of awareness training;
- Air monitoring;
- Managing stockpiles;
- Area segregation;
- Wheel washing
- Road washing/cleaning

It is important to note that during Site reconnaissance visits, Site investigation works and Site remediation that asbestos should not be considered in isolation and control measures are likely to form part of a wider health and safety precautions.

Respiratory protective equipment (RPE)

RPE is the last line of defence and its requirement would be defined by the CAR risk assessment. HSE (2013b) advises that RPE should have an assigned protection factor of 20 or more for all work with asbestos. In certain instances, full face-piece, positive pressure respirators with a protection factor of 40 are necessary (to EN 12942:1998, TM3).

Suitable types of RPE for most **short** duration non-licensed asbestos work:

- Disposable respirator to standards EN149 (type FFP3) or EN1827 (type FMP3)
- Half mask respirator (to standard EN140) with P3 filter
- Semi-disposable respirator (to EN405) with P3 filter

These filters are not suitable for people with beards/stubble or for long or continuous use.

LICENSING

CAR defined certain types of activities involving asbestos as 'licensable work' (LW) or as 'notifiable non-licensable work' (NNLW). All other work would be 'non-licensable work' (NLW).

LW is defined as:

- work where exposure is not 'sporadic and low intensity'
- work where the risk assessment cannot demonstrate that the control limits (four hour and 10 minute limits) will not be exceeded
- work on asbestos coating
- work on AIB or insulation where risk assessment is either of first two points above or not of short duration (where short duration is defined for any work liable to disturb asbestos as taking less than two hours per week (including ancillary work) and no one person carries out that work for more than one hour').

NNLW includes work with:

- AIB or asbestos insulation of short duration that is not licensable
- fire-damaged asbestos cement or asbestos cement damaged so as to create significant dust and debris
- asbestos ropes, yarns, woven cloths in poor condition or handling cutting or breaking up the materials
- asbestos papers, felts, and cardboard in poor condition, unencapsulated or not bound into another material.

Work with weathered asbestos cement, air monitoring and collecting samples of ACM in buildings would not normally be notifiable.

It is impossible to specify definitively what activities will and will not be licensable. This decision should be made as part of the CAR risk assessment. CAR is not primarily aimed at work with ACSs and there is little published information on airborne asbestos concentrations during work with ACSs. Nevertheless, CAR will require some remediation projects, and occasionally site investigations, to be LW. Investigations on other sites may involve NNLW. The decision as to whether work is LW or NNLW should be made during the CAR risk assessment by those in charge of the brownfield site investigations and remediation projects.

TRAINING REQUIREMENTS

Asbestos health and safety courses are offered by a number of providers in the UK. Training courses that include the problem of identifying ACMs in soil should be undertaken at regular intervals by those involved in the investigation, assessment, and management of sites where ACs are known or suspected. It is the role of the employer to identify the level of training required for an employee based on their role, experience, and duties. Reference to Regulation 10 of CAR should be referred to for more information on training requirements.

Recognising asbestos within soils is challenging due to the heterogeneity of such soils and the discolouration of asbestos by smeared soil. Specific training for ground workers should include understanding fibre release potential, potential control measures in the field, how to take representative ACSs safely, sample labelling and what analytical tests are available and when they should be implemented.

Health and safety training required under CAR includes asbestos awareness, non-licensable work (including notifiable non-licensable work) and licensable work with asbestos.

In addition to health and safety training, some staff involved in the technical identification on site of ACMs, sampling and analysis may require technical proficiency training (competency training).

Training vs. Competence

HSE (2005) identifies that 'training alone does not make people competent. Training must be consolidated by practical experience so that the person becomes confident, skilful and knowledgeable in practice on the job'. It is critical that ACS surveyors demonstrate competency with details of relevant field experience alongside training and examples of previous works/references.