

APPENDIX E



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Attention : Nick Adams
Date : 3rd April, 2018
Your reference :
Our reference : Test Report 18/4474 Batch 1
Location : Arthurs Lane, Hambleton
Date samples received : 24th March, 2018
Status : Final report
Issue : 1

Seventeen samples were received for analysis on 24th March, 2018 of which seventeen 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.

Compiled By:



Lucas Halliwell
Project Co-ordinator

Client Name: Robert E Fry & Associates Ltd
 Reference:
 Location: Arthurs Lane, Hambleton
 Contact: Nick Adams
 JE Job No.: 18/4474

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

J E Sample No.	1	2	3	4	5	6	7	8	9	10	Please see attached notes for all abbreviations and acronyms		
Sample ID	TP 01	TP 02	TP 05	TP 09	TP 11	TP 14	TP 17	TP 19	TP 20	TP 22	LOD/LOR	Units	Method No.
Depth	0.20	0.20	0.20	0.30	0.10	0.20	0.20	0.20	0.10	0.20			
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018			
Arsenic #	1.1	9.2	7.7	9.1	9.3	7.7	7.6	9.6	8.3	8.3	<0.5	mg/kg	TM30/PM15
Cadmium #	0.2	<0.1	<0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	<0.1	mg/kg	TM30/PM15
Chromium #	13.2	51.3	51.5	51.2	46.0	48.5	48.3	47.7	56.1	72.8	<0.5	mg/kg	TM30/PM15
Copper #	5	15	33	33	31	19	31	29	38	32	<1	mg/kg	TM30/PM15
Lead #	<5	12	32	33	34	28	34	41	28	31	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Nickel #	7.3	32.1	15.0	17.2	17.1	14.5	18.4	18.4	19.8	23.0	<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM30/PM15
Zinc #	17	44	94	93	88	63	99	87	105	87	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.08	<0.03	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.21	0.04	0.17	0.06	0.05	<0.03	0.05	0.07	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	0.18	<0.03	0.14	0.06	0.05	<0.03	0.05	0.05	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.10	<0.06	0.13	<0.06	<0.06	<0.06	0.11	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	0.11	<0.02	0.10	0.05	0.04	<0.02	0.04	0.05	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.24	<0.07	0.17	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.12	<0.04	0.09	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.11	<0.04	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.10	<0.04	0.06	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.3	<0.6	1.0	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.17	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.07	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	76	70	72	71	71	72	73	72	71	71	<0	%	TM4/PM8
Total Phenols HPLC	0.25	<0.15	<0.15	<0.15	0.15	<0.15	0.19	<0.15	0.17	<0.15	<0.15	mg/kg	TM26/PM21
Natural Moisture Content	16.3	14.2	28.7	29.3	27.6	22.2	33.3	30.0	52.7	32.8	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	14.0	12.5	22.3	22.7	21.6	18.2	25.0	23.1	34.5	24.7	<0.1	%	PM4/PM0
Sulphate as SO4 (2:1 Ext) #	0.0113	0.0149	0.0044	0.0051	0.0035	0.0017	0.0153	0.0119	0.0063	0.0034	<0.0015	g/l	TM38/PM20
Total Cyanide #	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	0.33	0.20	1.85	2.07	2.09	1.11	2.39	2.11	2.88	2.51	<0.02	%	TM21/PM24
Sulphide	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM106/PM119

Client Name: Robert E Fry & Associates Ltd
 Reference:
 Location: Arthurs Lane, Hambleton
 Contact: Nick Adams
 JE Job No.: 18/4474

Report : Solid

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J E Sample No.	1	2	3	4	5	6	7	8	9	10			
Sample ID	TP 01	TP 02	TP 05	TP 09	TP 11	TP 14	TP 17	TP 19	TP 20	TP 22	Please see attached notes for all abbreviations and acronyms		
Depth	0.20	0.20	0.20	0.30	0.10	0.20	0.20	0.20	0.10	0.20			
COC No / misc													
Containers	J	J	J	J	J	J	J	J	J	J			
Sample Date	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018	21/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	LOD/LOR	Units	Method No.
pH #	8.30	8.41	7.08	6.85	6.75	7.06	6.93	6.41	7.05	6.63	<0.01	pH units	TM73/PM11

Exova Jones Environmental

Client Name: Robert E Fry & Associates Ltd
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JE Job No.: 18/4474

Report : Solid
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J E Sample No.	11	12	13	14	15	16	17																					
Sample ID	TP 24	TP 27	TP 30	TP 32	TP 37	TP 38	TP 35																					
Depth	0.10	0.10	0.10	0.10	0.20	0.10	0.20																					
COC No / misc																												
Containers	J	J	J	J	J	J	J																					
Sample Date	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018																					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil																					
Batch Number	1	1	1	1	1	1	1																					
Date of Receipt	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018																					

Please see attached notes for all abbreviations and acronyms

Exova Jones Environmental

Client Name: Robert E Fry & Associates Ltd
 Reference:
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Report : Solid

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

J E Sample No.	11	12	13	14	15	16	17												
Sample ID	TP 24	TP 27	TP 30	TP 32	TP 37	TP 38	TP 35												
Depth	0.10	0.10	0.10	0.10	0.20	0.10	0.20												
COC No / misc																			
Containers	J	J	J	J	J	J	J												
Sample Date	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018	22/03/2018												
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil												
Batch Number	1	1	1	1	1	1	1												
Date of Receipt	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018	24/03/2018												
pH #	6.64	6.80	6.91	6.91	5.88	6.27	6.62												

Please see attached notes for all abbreviations and acronyms

LOD/LOR

Units

Method No.

Client Name: Robert E Fry & Associates Ltd
Reference:
Location: Arthurs Lane, Hambleton
Contact: Nick Adams


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, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:


 Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/4474	1	TP 01	0.20	1	27/03/2018	General Description (Bulk Analysis)	soil.stones
					27/03/2018	Asbestos Fibres	NAD
					27/03/2018	Asbestos Fibres (2)	NAD
					27/03/2018	Asbestos ACM	NAD
					27/03/2018	Asbestos ACM (2)	NAD
					27/03/2018	Asbestos Type	NAD
					27/03/2018	Asbestos Type (2)	NAD
					27/03/2018	Asbestos Level Screen	NAD
18/4474	1	TP 02	0.20	2	27/03/2018	General Description (Bulk Analysis)	soil.stones
					27/03/2018	Asbestos Fibres	NAD
					27/03/2018	Asbestos Fibres (2)	NAD
					27/03/2018	Asbestos ACM	NAD
					27/03/2018	Asbestos ACM (2)	NAD
					27/03/2018	Asbestos Type	NAD
					27/03/2018	Asbestos Type (2)	NAD
					27/03/2018	Asbestos Level Screen	NAD

Client Name: Robert E Fry & Associates Ltd
Reference:
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J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 18/4474						

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

JE Job No.: 18/4474

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. 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.

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

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

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.

Please include all sections of this report if it is reproduced

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

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.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental 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

JE Job No: 18/4474

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
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 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 8270 method for the solvent extraction and determination of 16 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
TM21	Modified USEPA 415.1. 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
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21	As received solid or water samples are extracted in Methanol: Sodium Hydroxide (0.1M NaOH) (60:40) by orbital shaker.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	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
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	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
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	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 and 9045D and BS1377:1990. 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
TM89	Modified USEPA method OIA-1667. Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide and Thiocyanate analysis.	Yes		AR	Yes

JE Job No: 18/4474

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
TM106	Determination of Sulphide by Skalar Continuous Flow Analyser	PM119	As received solid samples are extracted with 1M NaOH by orbital shaker for Sulphide and Thiocyanate analysis.			AR	Yes