

Mrs Jane Baines
MT Baines & Sons
Wood Farm
Stanton Lane
Ellistown
Leicestershire
LE67 1FF

Dear Jane,

Re: Land adjacent to Wood Farm, Stanton Lane, Stanton Under Bardon – contaminated land investigation for proposed replacement farm managers dwellings

Background

Erda Associates Ltd. were requested by Mrs Jane Baines (hereafter referred to as the client) to undertake an contaminated land investigation to assess the risk of potentially contaminated soils at the site known as *land adjacent to Wood Farm, Stanton Under Bardon*. Site location and boundary plans are included in **Appendix A**.

It is understood that these works were required as part of Planning Applications 20/00407/HYB and 21/00531/HYB which are for the erection general industrial buildings and storage buildings. As part of the application an existing farmstead will be demolished, with two replacement farm managers dwellings and associated agricultural buildings. It is noted that the proposed agricultural buildings are proposed to be constructed on an existing agricultural field. It is not considered that this proposed use constitutes a significant change in use from the current use (e.g. the site will remain in agricultural use). Therefore, it was not considered that a contaminated land investigation was required for this part of the development as there is no increased risk to proposed end users. Furthermore, construction of the farm buildings will effectively cap the majority of shallow soils with hardstanding and floor slabs which will further mitigate any residual risk.

As the proposed farm managers dwellings do constitute a change in use (e.g. from agricultural to residential), it was considered that a contamination assessment would be required for this part of the development. For clarity, this assessment will deal solely with proposed site of the two replacement farm managers dwellings.

Site Setting & History

A review of historic mapping has revealed that the site of the proposed two new farm managers dwellings has comprised an agricultural field from 1884 to the present day. No historic or current landfill sites are recorded within 500m of the site.

Based on the above, the risk of contamination being present at the site is considered to be low, however, precautionary chemical screening of the shallow soils was advised to assess this. The following letter report details our investigation.

Site Works

Erda Associates Ltd. (Erda) were asked to attend the subject site on 17th October 2022 to undertake the necessary ground investigation works for the subject site.

A total of six shallow hand dug samples of the topsoil were retrieved from the site. The samples were generally targeted within the proposed external garden areas of the proposed dwellings.

All samples were sent for analysis at a UKAS/MCERTS accredited laboratory and screened for heavy metals and PAHs as a precaution. A sampling plan is enclosed in **Appendix A** and the laboratory test results are included in **Appendix B**.

Contamination Assessment

Tier 1 Assessment Criteria for human health with regard to contamination within soils have been produced with reference to values published in LQM/CIEH S4UL and DEFRA's C4SLs. The Tier 1 Assessment Criteria are contained in **Appendix C**. The laboratory analysis results were reviewed against the assessment criteria for a residential with produce end use. A SOM of 1% has been adopted for the PAH analysis.

An assessment of the analysis results for metals and inorganics contained in **Appendix B**, revealed that all samples do not exceed the respective GAC for residential end use with produce. Therefore, the risk of contamination to end users is considered to be very low and remediation with regard to contaminated soils is not considered to be required.

As no historic or current landfill sites are recorded within 500m of the site, the risk of ground gas is assessed as being very low. Therefore, ground gas protection measures will not be required to protect future end users of the site.

Conclusion and Recommendations

No significant contamination has been identified within the shallow soils, and further remediation to make the site suitable for the proposed end use is not considered to be required. In addition, no potential ground gas sources have been identified and ground gas protection measures are not considered to be required.

In the unlikely event that any other contamination, be either observed or suspected during the redevelopment works, Erda should be notified to make further assessment.

Should you have any queries, or require any further information, please do not hesitate to contact us.

Yours Sincerely



Phil Devitt, BSc MSc MRICS
Director

Encl.

Appendix A – Site Plans

Appendix B – Chemical Analysis Results

Appendix C – Erda Associates Tier 1 GACs and Methodology

Appendix A

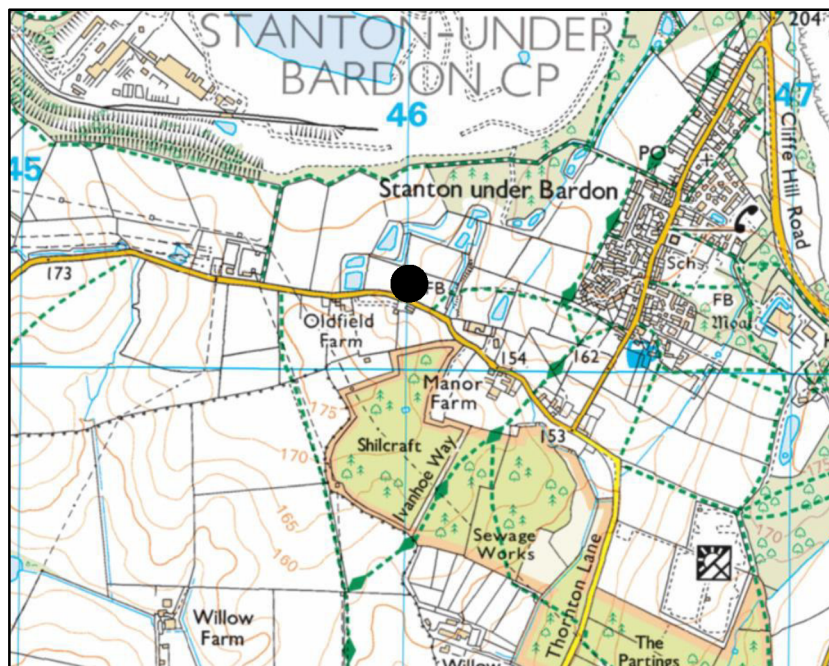




KEY:

● Approximate Site Location

DO NOT SCALE



TITLE:

Site Location Plan

PROJECT:

Wood Farm, Stanton Under Bardon

PROJECT No:

EAL.151.22

DATE:

10/2022

SCALE:

NTS

DRAWN:

PD

DWG No:

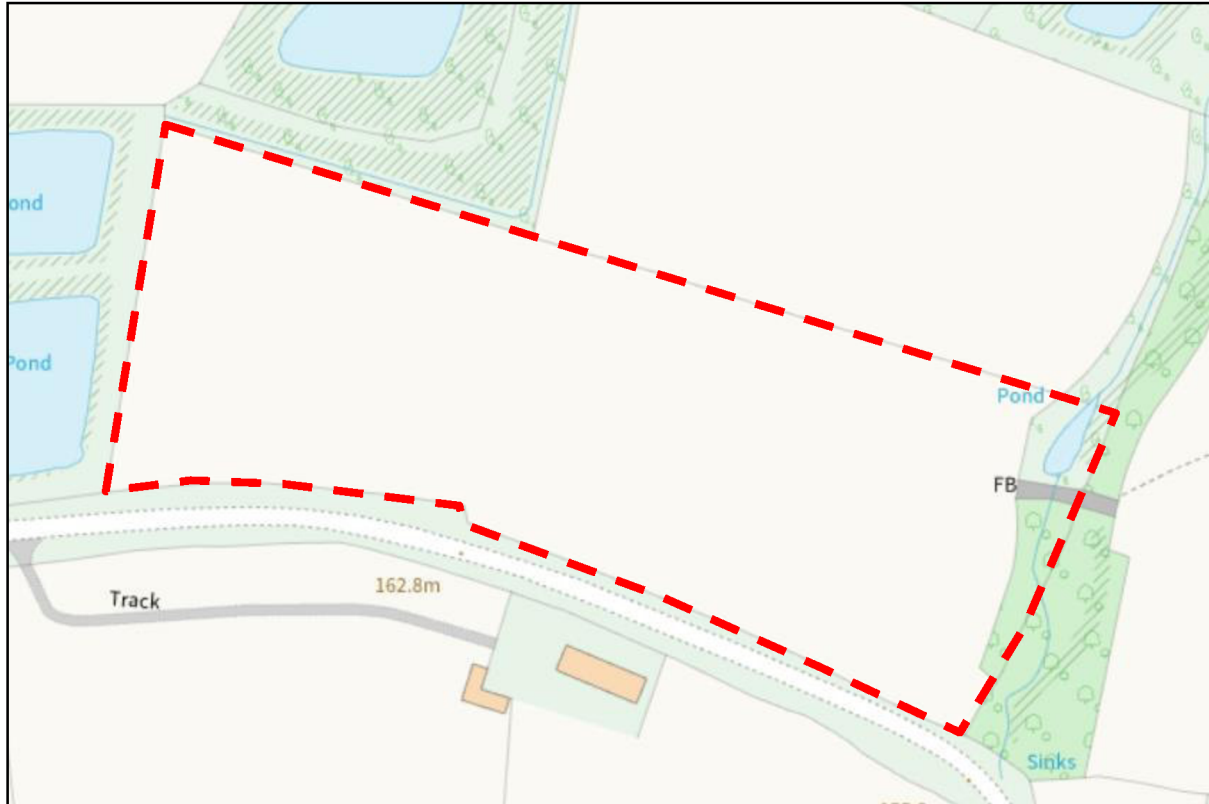
Figure 1



KEY:



Site Boundary



DO NOT SCALE



TITLE:

Site Layout

PROJECT:

Wood Farm, Stanton Under Bardon

PROJECT No:

EAL.151.22

DATE:

10/2022

SCALE:

NTS

DRAWN:

PD

DWG No:

Figure 2



KEY:

DO NOT SCALE



TITLE:

Development Proposal

PROJECT:

Wood Farm, Stanton Under Bardon

PROJECT No:

EAL.151.22

DATE:

10/2022

SCALE:

NTS

DRAWN:

PD

DWG No:

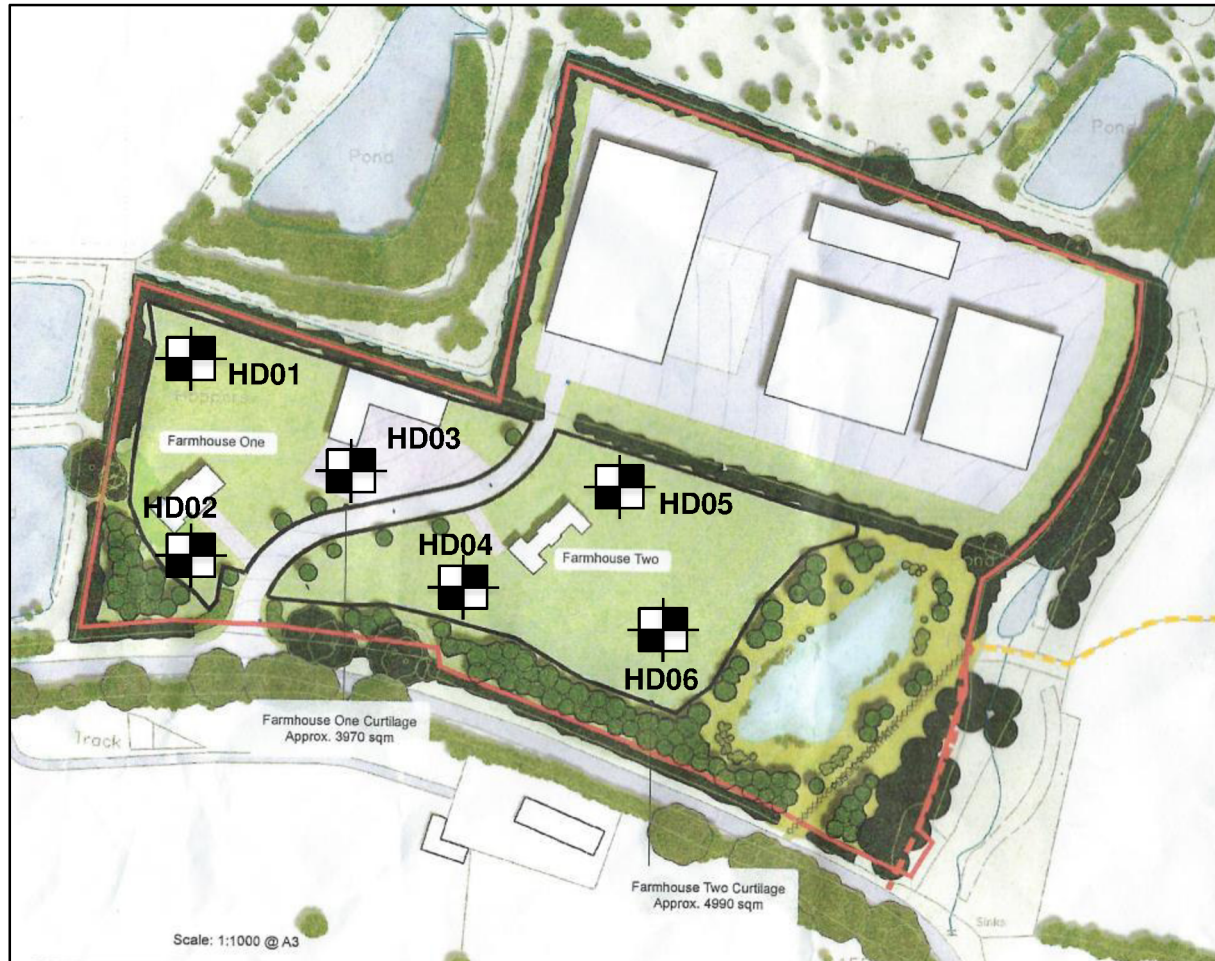
Figure 3



KEY:



Trial Pit



DO NOT SCALE



TITLE:

Exploratory Hole Location Plan

PROJECT:

Wood Farm, Stanton Under Bardon

PROJECT No:

EAL.151.22

DATE:

10/2022

SCALE:

NTS

DRAWN:

PD

DWG No:

Figure 4

Appendix B





ANALYTICAL TEST REPORT

Contract no: 114842

Contract name: Wood Farm, Stanton under Bardon

Client reference: EAL.151.22

Clients name: Erda Associates

Clients address: 102 Scalpcliffe Road
Burton on Trent
Staffordshire
DE15 9AB

Samples received: 20 October 2022

Analysis started: 20 October 2022

Analysis completed: 27 October 2022

Report issued: 27 October 2022

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:



Rachael Burton
Reporting Manager

Chemtech Environmental Limited

SAMPLE INFORMATION

MCERTS (Soils):

Soil descriptions are only intended to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions. MCERTS accreditation applies for sand, clay and loam/topsoil, or combinations of these whether these are derived from naturally occurring soils or from made ground, as long as these materials constitute the major part of the sample. Other materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Lab ref	Sample id	Depth (m)	Sample description	Material removed	% Removed	% Moisture
114842-1	HD01	0.10	Sandy Loam with Gravel	-	-	13.2
114842-2	HD02	0.20	Sandy Clayey Loam with Gravel & Roots	-	-	23.4
114842-3	HD03	0.10	Sandy Clayey Loam with Gravel & Roots	-	-	15.0
114842-4	HD04	0.10	Sandy Clayey Loam with Gravel & Roots	-	-	12.2
114842-5	HD05	0.20	Sandy Clayey Loam with Gravel & Roots	-	-	17.5
114842-6	HD06	0.20	Sandy Clayey Loam with Gravel & Roots	-	-	14.6

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SOILS

Lab number Sample id Depth (m) Date sampled			114842-1 HD01 0.10 17/10/2022	114842-2 HD02 0.20 17/10/2022	114842-3 HD03 0.10 17/10/2022	114842-4 HD04 0.10 17/10/2022	114842-5 HD05 0.20 17/10/2022	114842-6 HD06 0.20 17/10/2022
Test	Method	Units						
Arsenic (total)	CE127 ^M	mg/kg As	10	7.5	13	7.5	13	8.8
Cadmium (total)	CE127 ^M	mg/kg Cd	0.2	0.2	0.4	0.2	0.4	0.2
Chromium (total)	CE127 ^M	mg/kg Cr	63	55	57	59	64	53
Chromium (VI)	CE146	mg/kg CrVI	<1	<1	<1	<1	<1	<1
Copper (total)	CE127 ^M	mg/kg Cu	17	13	18	16	28	21
Lead (total)	CE127 ^M	mg/kg Pb	34	25	28	23	40	29
Mercury (total)	CE127 ^M	mg/kg Hg	1.4	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel (total)	CE127 ^M	mg/kg Ni	21	15	27	17	28	17
Selenium (total)	CE127 ^M	mg/kg Se	0.9	0.9	1.0	0.7	1.2	0.8
Vanadium (total)	CE127 ^M	mg/kg V	41	33	41	32	63	41
Zinc (total)	CE127 ^M	mg/kg Zn	76	61	75	63	107	67
pH	CE004 ^M	units	6.1	6.1	6.4	5.8	5.7	5.8
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	23	27	27	22	30	105
Sulphate (acid extractable)	CE062 ^M	mg/kg SO ₄	544	608	585	425	825	605
Total Organic Carbon (TOC)	CE197	% w/w C	3.8	4.4	3.5	2.3	4.9	4.3
Estimate of OMC (calculated from TOC)	CE197	% w/w	6.5	7.6	6.1	3.9	8.5	7.4
PAH								
Naphthalene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	CE087 ^U	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	CE087 ^M	mg/kg	0.04	<0.02	<0.02	0.14	0.05	0.03
Anthracene	CE087 ^U	mg/kg	<0.02	<0.02	<0.02	0.04	<0.02	<0.02
Fluoranthene	CE087 ^M	mg/kg	0.14	0.07	0.06	0.38	0.15	0.11
Pyrene	CE087 ^M	mg/kg	0.13	0.06	0.05	0.33	0.12	0.10
Benzo(a)anthracene	CE087 ^U	mg/kg	0.07	0.03	0.03	0.16	0.06	0.06
Chrysene	CE087 ^M	mg/kg	0.08	0.03	0.03	0.17	0.07	0.06
Benzo(b)fluoranthene	CE087 ^M	mg/kg	0.07	0.04	0.04	0.11	0.06	0.03
Benzo(k)fluoranthene	CE087 ^M	mg/kg	0.05	<0.03	<0.03	0.07	0.04	<0.03
Benzo(a)pyrene	CE087 ^U	mg/kg	0.07	0.04	0.04	0.15	0.07	0.06
Indeno(123cd)pyrene	CE087 ^M	mg/kg	0.06	0.03	0.03	0.13	0.06	0.05
Dibenz(ah)anthracene	CE087 ^M	mg/kg	<0.02	<0.02	<0.02	0.03	<0.02	<0.02
Benzo(ghi)perylene	CE087 ^M	mg/kg	0.04	0.03	0.03	0.10	0.05	0.02
PAH (total of USEPA 16)	CE087	mg/kg	0.75	<0.34	<0.34	1.82	0.72	0.53

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METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE127	Arsenic (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg As
CE127	Cadmium (total)	Aqua regia digest, ICP-MS	Dry	M	0.2	mg/kg Cd
CE127	Chromium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cr
CE146	Chromium (VI)	Acid extraction, Colorimetry	Dry		1	mg/kg CrVI
CE127	Copper (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Cu
CE127	Lead (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Pb
CE127	Mercury (total)	Aqua regia digest, ICP-MS	Dry	M	0.5	mg/kg Hg
CE127	Nickel (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg Ni
CE127	Selenium (total)	Aqua regia digest, ICP-MS	Dry	M	0.3	mg/kg Se
CE127	Vanadium (total)	Aqua regia digest, ICP-MS	Dry	M	1	mg/kg V
CE127	Zinc (total)	Aqua regia digest, ICP-MS	Dry	M	5	mg/kg Zn
CE004	pH	Based on BS 1377, pH Meter	As received	M	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄
CE062	Sulphate (acid extractable)	HCl extract, analysed by ICP-OES	Dry	M	100	mg/kg SO ₄
CE197	Total Organic Carbon (TOC)	Carbon Analyser	Dry		0.1	% w/w C
CE197	Estimate of OMC (calculated from TOC)	Calculation from Total Organic Carbon	Dry		0.1	% w/w
CE087	Naphthalene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Acenaphthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Fluorene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Phenanthrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(a)anthracene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Chrysene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(b)fluoranthene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(k)fluoranthene	Solvent extraction, GC-MS	As received	M	0.03	mg/kg
CE087	Benzo(a)pyrene	Solvent extraction, GC-MS	As received	U	0.02	mg/kg
CE087	Indeno(123cd)pyrene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Dibenz(ah)anthracene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	Benzo(ghi)perylene	Solvent extraction, GC-MS	As received	M	0.02	mg/kg
CE087	PAH (total of USEPA 16)	Solvent extraction, GC-MS	As received		0.34	mg/kg

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DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
114842-1	HD01	0.10	N	
114842-2	HD02	0.20	N	
114842-3	HD03	0.10	N	
114842-4	HD04	0.10	N	
114842-5	HD05	0.20	N	
114842-6	HD06	0.20	N	

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ADDITIONAL INFORMATION

Notes

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

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 4 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

For soils and solids, analytical results are inclusive of stones, where applicable.

Appendix C



Tier 1 Assessment Criteria

	Residential With Produce (mg/kg) -			
Determinand	1% SOM			Source
Arsenic	37.00			LQM S4UL
Boron	290.00			LQM S4UL
Cadmium	22.00			C4SL
Chromium III	910.00			LQM S4UL
Chromium VI	6.00			LQM S4UL
Lead	200.00			C4SL
Mercury, elemental	1.20			LQM S4UL
Mercury, inorganic	40.00			LQM S4UL
Mercury, methyl	11.00			LQM S4UL
Selenium	250.00			LQM S4UL
Nickel	180.00			LQM S4UL
Copper	2400.00			LQM S4UL
Vanadium	410.00			LQM S4UL
Zinc	3700.00			LQM S4UL
Total Cyanide	34.00			In House*
Polycyclic Aromatic Hydrocarbons				
	SOM 1%	SOM 2.5%	SOM 6%	
Benzo(a)pyrene	2.20	2.70	3.00	LQM S4UL
Dibenz(ah)anthracene	0.24	0.28	0.30	LQM S4UL
Acenaphthene	210.00	510.00	1100.00	LQM S4UL
Acenaphthylene	170.00	420.00	920.00	LQM S4UL
Anthracene	2400.00	5400.00	11000.00	LQM S4UL
Benzo(a)anthracene	7.20	11.00	13.00	LQM S4UL
Benzo(b)fluoranthene	2.60	3.30	3.70	LQM S4UL
Benzo(ghi)perylene	320.00	340.00	350.00	LQM S4UL
Benzo(k)fluoranthene	77.00	93.00	100.00	LQM S4UL
Chrysene	15.00	22.00	27.00	LQM S4UL
Fluoranthene	280.00	560.00	890.00	LQM S4UL
Fluorene	170.00	400.00	860.00	LQM S4UL
Indeno(123cd)pyrene	27.00	36.00	41.00	LQM S4UL
Phenanthrene	95.00	220.00	440.00	LQM S4UL
Pyrene	620.00	1200.00	2000.00	LQM S4UL
Naphthalene	2.30	5.60	13.00	LQM S4UL

Note:

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* Values calculated using CLEA v1.071

Tier 1 Assessment Criteria

Determinand	Residential With Produce			Source
	1% SOM	2.5% SOM	6% SOM	
Benzene	0.087	0.17	0.37	LQM S4UL
Ethylbenzene	47.00	110.00	260.00	LQM S4UL
Phenol	280.00	550.00	1100.00	LQM S4UL
Toulene	130.00	290.00	660.00	LQM S4UL
Xylene, o-	60.00	140.00	330.00	LQM S4UL
Xylene, m-	59.00	140.00	320.00	LQM S4UL
Xylene, p-	56.00	130.00	310.00	LQM S4UL
Aliphatic C5-C6	42	78	160	LQM S4UL
Aliphatic C6-C8	100	230	530	LQM S4UL
Aliphatic C8-C10	27	65	150	LQM S4UL
Aliphatic C10-C12	130 (48) ^{vap}	330 (118) ^{vap}	760 (283) ^{vap}	LQM S4UL
Aliphatic C12-C16	1100 (24) ^{sol}	2400 (59) ^{sol}	4300 (142) ^{sol}	LQM S4UL
Aliphatic C16-C35	65000 (8.48) ^{sol}	92000 (21) ^{sol}	110000	LQM S4UL
Aliphatic C35-C44	65000 (8.48) ^{sol}	92000 (21) ^{sol}	110000	LQM S4UL
Aromatic C5-C7	70	140	300	LQM S4UL
Aromatic C7-C8	130	290	660	LQM S4UL
Aromatic C8-C10	34	83	190	LQM S4UL
Aromatic C10-C12	74	180	380	LQM S4UL
Aromatic C12-C16	140	330	660	LQM S4UL
Aromatic C16-C21	260	540	930	LQM S4UL
Aromatic C21-C35	1100	1500	1700	LQM S4UL
Aromatic C35-C44	1100	1500	1700	LQM S4UL
Combined Aliphatic and Aromatic C44-C70	1600	1800	1900	LQM S4UL

Note:

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^{vap} - S4UL presented exceed the vapour saturation limit, which is presented in brackets.

^{sol} - S4UL presented exceeds the solubility saturation limit, which is presented in brackets.