Our Ref: 2305018.001.01
Your Ref:

28 June 2023

The Old Chapel
35a Southover
Wells
Somerset
BA5 1UH

t: 01749 677760
w: www.tecon.co.uk

Laurence Ovens
By email only

Dear Laurence,

WOOLLEY GREEN FARM, BRADFORD ON AVON – INITIAL CONTAMINATION APPRAISAL

Further to instruction TEC has undertaken an Initial Contamination Appraisal of the abovementioned site in support of the proposed site development. Works have been undertaken in accordance with our proposal dated 30th May 2023, referenced ST.2305018.001.

Background

The site is situated off the B3105 to the northeast of Bradford-on-Avon (Figure 1) and currently comprises 2No. industrial workshops/warehouses with associated access road (concrete/gravel) and area of soft landscaping (rough ground) in the north of site. The site is roughly 0.5 hectares in size with the centre located at approximate National Grid Reference 383723, 161755. The closest postcode to site is BA15 1TY.

The proposed development is understood to comprise the demolition of existing structures to allow for the construction of 3No. assumed low rise residential properties with associated areas of soft landscaping and hard infrastructure (Figure 2).

The published geology records the site to be underlain by the Forest Marble Formation, described by the BGS as silicate-mudstone, greenish grey, variably calcareous and in the south notably sandy, with lenticular typically cross-bedded limestone units that form banks and channel-fills, especially in lower part. A variety of limestone types occur, of which grey, weathering brown and flaggy, variably sandy medium to coarsely bioclastic grainstone or less commonly packstone predominates, especially at the base, which is increasingly ooidal north from Bath (termed the Acton Turville Beds from Biddestone to Didmarton). Other types include fissile sandy limestone, grading to calcareous sandstone, and oyster-limestone. South of the Mendip Hills, a silici-muddy, fossiliferous lime-mudstone (Boueti Bed) lies at the base.

Methodology

5No. trial pits were excavated across site to a maximum depth of 0.85mbgl, the locations are shown on Figure 2. Photographs of encountered material are presented in Appendix A.

5No. representative samples of the shallow soils encountered were submitted for analysis at Derwentside Environmental Testing Services Ltd (DETS) a MCERTs/UKAS accredited laboratory for a selection of the following parameters:

Soils (Totals)

- Heavy metals and metalloids;
- Total Organic Carbon (TOC);
- Phenols (monohydric);
- Total Cyanide;

- Sulphate, sulphide, elemental sulphur and pH;
- Speciated Polyaromatic Hydrocarbons (PAH);
- Total Petroleum Hydrocarbons (TPH-CWG), including BTEX and MTBE; and
- Asbestos Screen.

Geochemical certificates of analysis are presented in Appendix C.

Encountered Ground Conditions

A summary of the encountered ground conditions is presented below, with detailed descriptions presented in the enclosed exploratory hole logs (Appendix B).

Made Ground

Made ground was encountered to a maximum depth of 0.7mbgl (average thickness of 0.48m) and generally comprised sand and gravel of concrete, brick and locally clinker, metal and plastic fragments.

Solid Geology

Solid geology, typical of the Forest Marble Formation, was encountered from depths of 0.3mbgl and generally comprised gravelly silty clay with gravel of limestone.

Groundwater

No groundwater was encountered during the intrusive works undertaken to date.

Contamination

No visual or olfactory evidence of significant contamination was recorded during the ground investigation. Screening of soil samples with a PID recorded concentrations of volatile organic compounds (VOCs) to be less than the instrument level of detection (i.e. 0.0ppm).

Geochemical Laboratory Results

An initial screening of soil samples taken as part of the exploratory ground investigation has been undertaken as follows.

Methodology

Detailed information on the background legislation and selection of the GAC used within this assessment is enclosed (Appendix D).

The standard land use for the site, for use in this initial assessment, has been defined as “residential with homegrown produce” based on the proposed development and in accordance with current guidance. The laboratory results have been directly compared to the relevant GAC.

No visual or olfactory evidence of significant contamination was identified within the natural ground during the intrusive investigation. Therefore, 5No. samples were collected from the encountered made ground materials at depths that site end users, may come into contact with via dermal contact, ingestion and inhalation pathways. Geochemical certificates of analysis are enclosed.

Summary of Results

The results of the initial screening are enclosed. The contamination screening recorded no exceedances of the GAC and therefore no contaminants of potential concern (CoPC) have been identified within the shallow soils.

An asbestos screen completed samples of the shallow soils at the laboratory recorded no suspected asbestos containing material or detectable asbestos fibres.

Conclusions and Recommendations

No remedial measures would be considered necessary based on the assessment undertaken to date.

Where appropriate and where made ground is encountered, good brownfield site working practices should be adopted by construction workers to mitigate against potential risks.

Should water supply pipes be placed within made ground encountered at site, due consideration would need to be given to the UK Water Industry Research Ltd (UKWIR) guidance.

Based on our conceptual understanding of the site to date, it would be anticipated that similar ground conditions to those encountered as part of this assessment exist across site aeras where access has been possible. However, should significant contamination be identified during development works, further investigation and assessment may be required.

Closure

We hope you find the above to your satisfaction, but should you have any quires please do not hesitate to contact us.

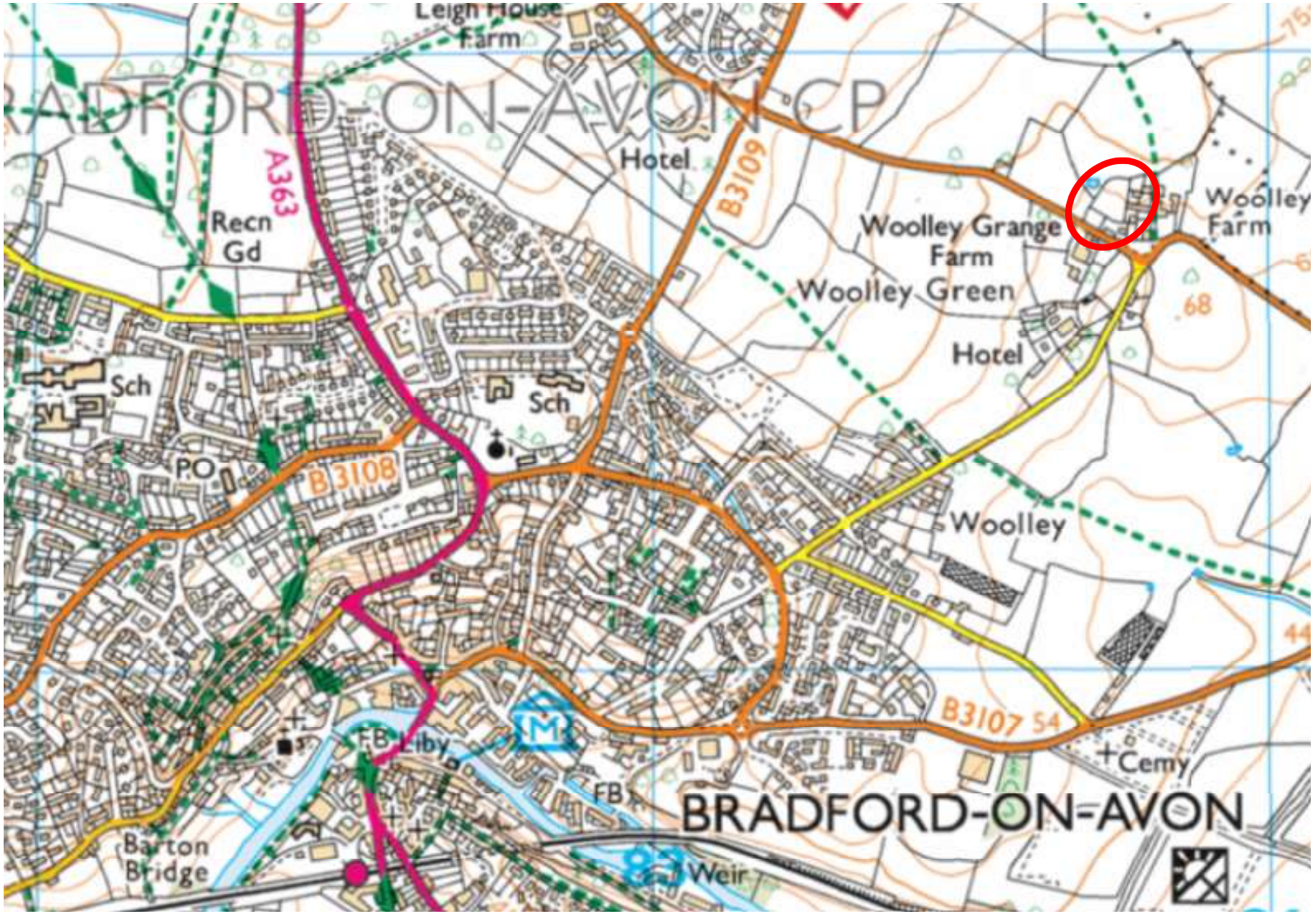
Yours sincerely

Amy Butler
Graduate Geoenvironmental Consultant
For and on behalf of
TEC

Claire Hooley
Director

Enc:
Figure 1 – Site Location Plan
Figure 2 – Proposed Development and Exploratory Hole Location Plan
Appendix A – Site Photographs
Appendix B – Exploratory Hole Logs – TP01 – TP05
Appendix C – Geochemical Certificates of Analysis (DETS Report No. 23-07845)
Appendix D – Generic Quantitative Risk Assessment – Human Health

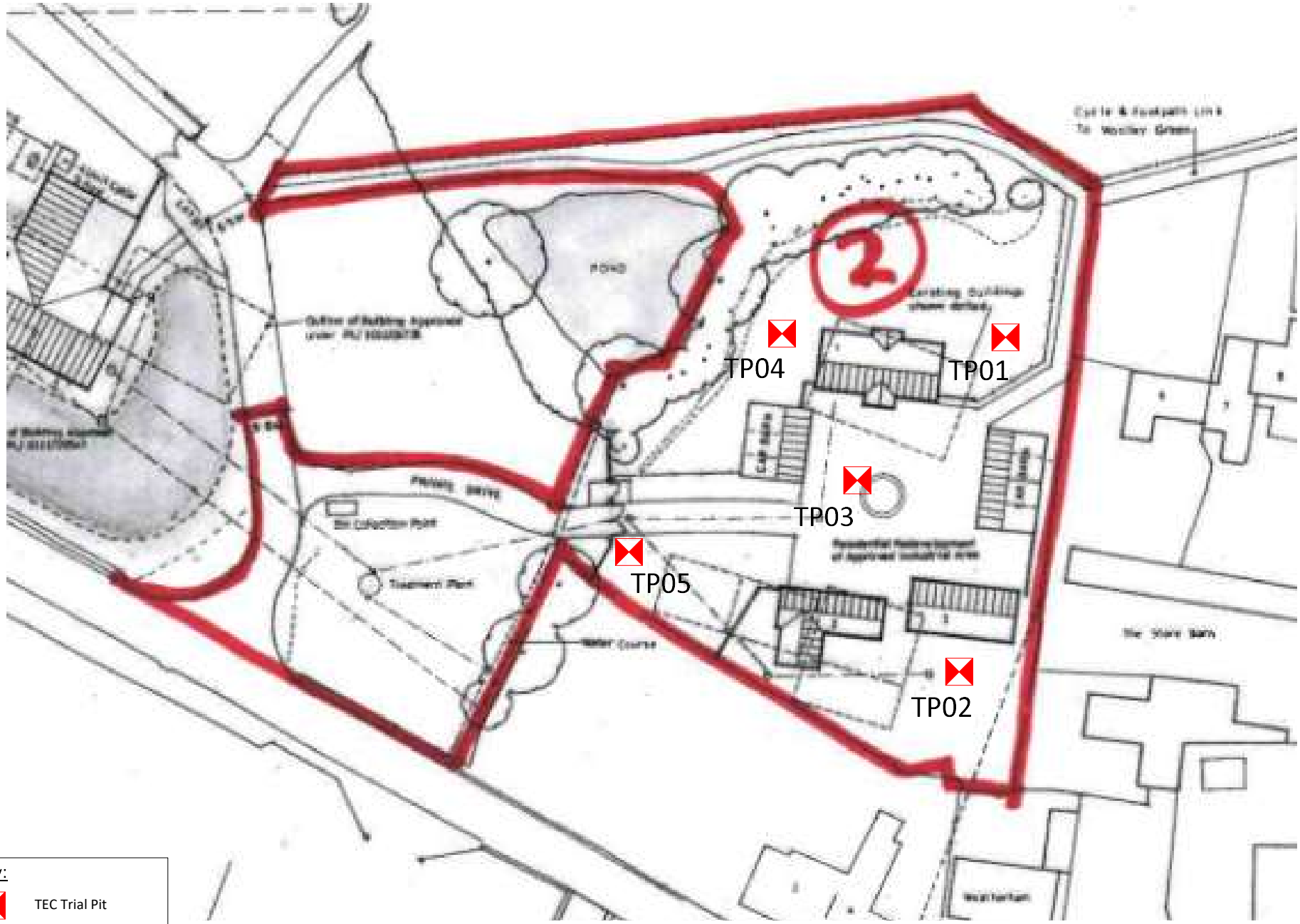
Figures



Approximate Site Location:

Ordnance Survey © Crown Copyright [2023] All rights reserved.
Licence number 100043301

tec	TEC The Old Chapel 35a Southover Wells, Somerset BA5 1UH	Tel: 01749 677760 Email: info@tecon.co.uk Web: www.tecon.co.uk	Site Name: Woolley Green, Bradford-on-Avon	Drawing Name: Site Location Plan	Client Name: Laurence Ovens	Project No: 2305018.001	Figure No: 1	Date: June 2023	Scale: NTS



Key:

TEC Trial Pit

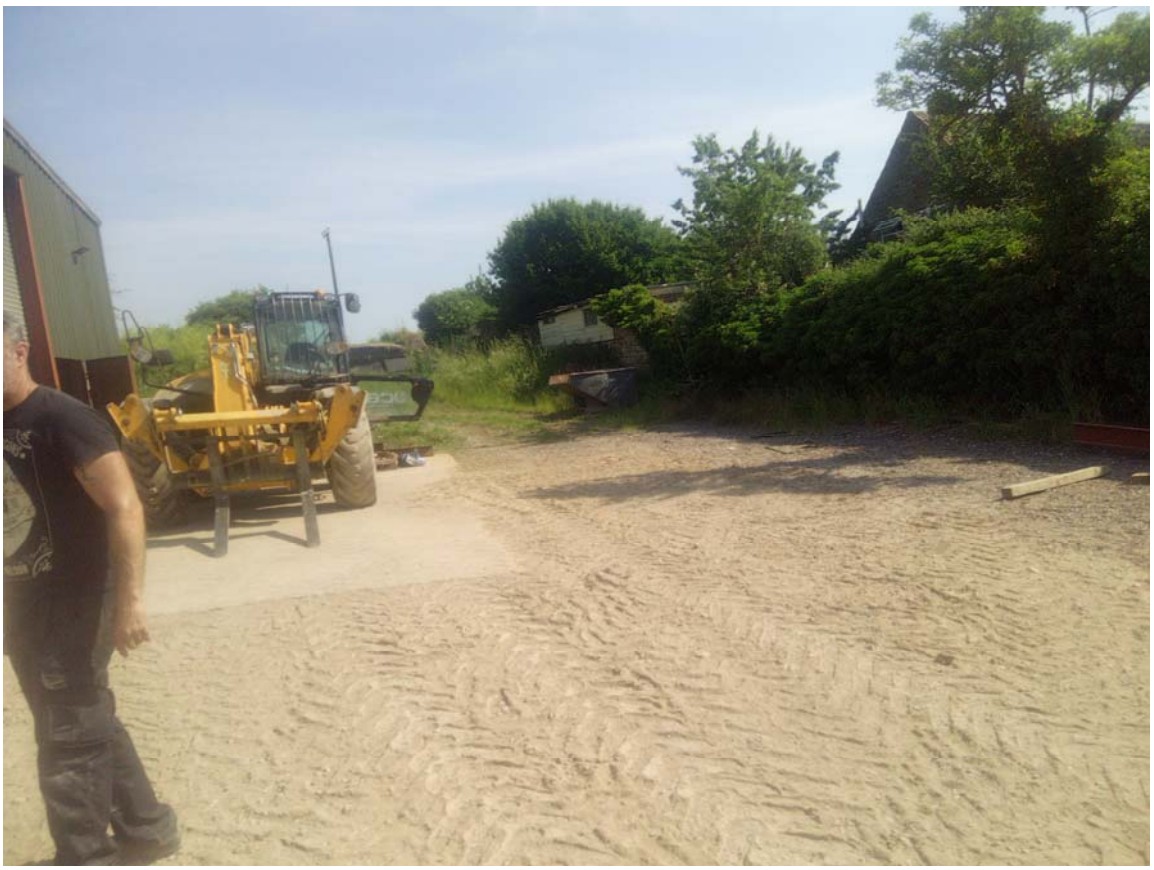
*All locations are approximate

Extract of Ashley Designs drawing titled 'Site Layout' drawing no. 2783-15, dated April 2023.

tec	TEC The Old Chapel 35a Southover Wells, Somerset BA5 1UH	Tel: 01749 677760 Email: info@tecon.co.uk Web: www.tecon.co.uk	Site Name: Woolley Green, Bradford-on-Avon	Drawing Name: Proposed Development and Exploratory Hole Location Plan	Client Name: Laurence Ovens	Project No: 2305018.001	Figure No: 2	Date: June 2023	Scale: NTS

Appendix A

Site Photographs



Photograph 1: Overall view of site facing north.



Photograph 2: Overall view of site facing west.



Photograph 3: Overall view of site facing northwest.



Photograph 4: TP01.



Photograph 5: TP02.



Photograph 6: TP03.



Photograph 7: TP04.



Photograph 8: TP05.

Appendix B

Exploratory Hole Logs

Trial Pit Log

Trial Pit No.
TP01
Sheet 1 of 1

Project Name: Woolley Green, Bradford-on-Avon	Client: Laurence Ovens	Date: 15/06/2023
Location: Bradford-on-Avon	Contractor:	
Project No. 2305018.001	Drilling Equipment: Mini Digger	Level:
Hole Type: TP	Logged By: AB	Scale: 1:25

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20 0.30 - 0.40	PID ES	0.00 ppmv	0.50			Grass over brown sandy gravel of brick concrete and ceramics. (MADE GROUND)
				0.85			Brown mottled greyish brown silty gravelly CLAY with gravel of fine to medium subangular limestone. (FOREST MARBLE FORMATION)
							End of Trial Pit at 0.85m

Dimensions		Trial Pit Support		Soakage Testing				
Pit Length (m)	Pit Width (m)	Pit Stability	Shoring Used	Test No.	Date Test	Duration (hh:mm)	Soil Infiltration Rate (m/s)	Remarks
1.80	0.90	Stable						

Remarks:
Trial pit terminated at depth
No groundwater encountered

Trial Pit Log

Trial Pit No. **TP02**

Sheet 1 of 1

Project Name: Woolley Green, Bradford-on-Avon	Client: Laurence Ovens	Date: 15/06/2023
Location: Bradford-on-Avon	Contractor:	
Project No. 2305018.001	Drilling Equipment: Mini Digger	Level:
Hole Type: TP	Logged By: AB	Scale: 1:25

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10 - 0.20	ES					Grey very gravelly sand with a low cobble content of concrete. Gravel consists of concrete and brick. (MADE GROUND)
	0.40	PID	0.00 ppmv	0.40			
				0.50			Dark brown sandy gravelly clay with gravel of brick and clinker. (MADE GROUND)
				0.70			Brown mottled greyish brown silty gravelly CLAY with gravel of fine to medium subangular limestone. (FOREST MARBLE FORMATION)
							End of Trial Pit at 0.70m

Dimensions		Trial Pit Support		Soakage Testing				
Pit Length (m)	Pit Width (m)	Pit Stability	Shoring Used	Test No.	Date Test	Duration (hh:mm)	Soil Infiltration Rate (m/s)	Remarks
1.60	0.80	Stable						

Remarks:
Trial pit terminated at depth
No groundwater encountered

Trial Pit Log

Trial Pit No. **TP03**

Sheet 1 of 1

Project Name: Woolley Green, Bradford-on-Avon	Client: Laurence Ovens	Date: 15/06/2023
Location: Bradford-on-Avon	Contractor:	
Project No. 2305018.001	Drilling Equipment: Mini Digger	Level:
Hole Type: TP	Logged By: AB	Scale: 1:25

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	PID	0.00 ppmv				Grey very gravelly sand with a low cobble content of concrete. Gravel consists of concrete and brick. (MADE GROUND)
				0.40			Brown mottled greenish brown slightly sandy slightly gravelly CLAY with gravel of fine to medium sub-angular limestone. (FOREST MARBLE FORMATION)
				0.60			End of Trial Pit at 0.60m

1
2
3
4

Dimensions		Trial Pit Support		Soakage Testing				
Pit Length (m)	Pit Width (m)	Pit Stability	Shoring Used	Test No.	Date Test	Duration (hh:mm)	Soil Infiltration Rate (m/s)	Remarks
1.10	0.80	Stable						

Remarks:
Trial pit terminated at depth
No groundwater encountered

Trial Pit Log

Trial Pit No. **TP04** Sheet 1 of 1

Project Name: Woolley Green, Bradford-on-Avon	Client: Laurence Ovens	Date: 15/06/2023
Location: Bradford-on-Avon	Contractor:	
Project No. 2305018.001	Drilling Equipment: Mini Digger	Level:
Hole Type: TP	Logged By: AB	Scale: 1:25

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	PID	0.00 ppmv				Grass over brown sandy gravel of brick concrete and occasional plastic and metal fragments. (MADE GROUND)
	0.50 - 0.60	ES					
	0.60	PID	0.00 ppmv	0.70			Brown mottled greyish brown silty gravelly CLAY with gravel of fine to medium subangular limestone. (FOREST MARBLE FORMATION)
				0.80			End of Trial Pit at 0.80m

Dimensions		Trial Pit Support		Soakage Testing				
Pit Length (m)	Pit Width (m)	Pit Stability	Shoring Used	Test No.	Date Test	Duration (hh:mm)	Soil Infiltration Rate (m/s)	Remarks
1.75	0.80	Stable						

Remarks:
Trial pit terminated at depth
No groundwater encountered

Trial Pit Log

Trial Pit No.
TP05
Sheet 1 of 1

Project Name: Woolley Green, Bradford-on-Avon	Client: Laurence Ovens	Date: 15/06/2023
Location: Bradford-on-Avon	Contractor:	
Project No. 2305018.001	Drilling Equipment: Mini Digger	Level:
Hole Type: TP	Logged By: AB	Scale: 1:25

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	PID	0.00 ppmv				Red sandy gravel of brick and concrete. (MADE GROUND)
	0.20 - 0.30	ES		0.30			Brown mottled greenish brown slightly sandy slightly gravelly CLAY with gravel of fine to medium sub-angular limestone. (FOREST MARBLE FORMATION)
				0.50			End of Trial Pit at 0.50m

Dimensions		Trial Pit Support		Soakage Testing				
Pit Length (m)	Pit Width (m)	Pit Stability	Shoring Used	Test No.	Date Test	Duration (hh:mm)	Soil Infiltration Rate (m/s)	Remarks
1.10	0.70	Stable						

Remarks:
Trial pit terminated at depth
No groundwater encountered

Appendix C

Geochemical Certificates of Analysis

Amy Butler
Tweedie Evans Consulting Limited t/a TEC
The Old Chapel
35a Southover
Wells
Somerset
BA5 1UH

Derwentside Environmental Testing Services Ltd
Unit 1
Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent
ME17 2JN
t: 01622 850410

DETS Report No: 23-07845

Site Reference:	Woolley Green, Bradford-On-Avon
Project / Job Ref:	2305018.001
Order No:	None Supplied
Sample Receipt Date:	16/06/2023
Sample Scheduled Date:	16/06/2023
Report Issue Number:	1
Reporting Date:	23/06/2023

Authorised by:

Kevin Old
Operations Director

Dates of laboratory activities for each tested analyte are available upon request.

Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate						
DETS Report No: 23-07845	**Date Sampled**	15/06/23	15/06/23	15/06/23	15/06/23	15/06/23
Tweedie Evans Consulting Limited t/a TEC	**Time Sampled**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Woolley Green, Bradford-On-Avon	**TP / BH No**	TP01	TP02	TP03	TP04	TP05
Project / Job Ref: 2305018.001	**Additional Refs**	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Order No: None Supplied	**Depth (m)**	0.30 - 0.40	0.10 - 0.20	0.20 - 0.30	0.50 - 0.60	0.20 - 0.30
Reporting Date: 23/06/2023	**DETS Sample No**	657765	657766	657767	657768	657769

Determinand	**Unit**	**RL**	**Accreditation**	(n)				
Asbestos Screen (S)	N/a	N/a	**ISO17025**	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
pH	pH Units	N/a	**MCERTS**	7.9	8.2	8.2	7.7	8.2
Total Cyanide	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO_4	mg/kg	< 200	**MCERTS**		746		770	745
Total Sulphate as SO_4	%	< 0.02	**MCERTS**		0.07		0.08	0.07
W/S Sulphate as SO_4 (2:1)	mg/l	< 10	**MCERTS**	21		30		
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	**MCERTS**	0.02		0.03		
Sulphide	mg/kg	< 5	NONE	< 5	< 5	< 5	< 5	< 5
TOC (Total Organic Carbon)	%	< 0.1	**MCERTS**	3.7	0.8	1.8	2.8	2.2
Arsenic (As)	mg/kg	< 2	**MCERTS**	13	12	20	12	9
Barium (Ba)	mg/kg	< 2.5	**MCERTS**	228	54	667	128	287
Beryllium (Be)	mg/kg	< 0.5	**MCERTS**	0.9	0.6	0.6	1	< 0.5
W/S Boron	mg/kg	< 1	NONE	1.6	< 1	< 1	1.3	< 1
Cadmium (Cd)	mg/kg	< 0.2	**MCERTS**	0.2	< 0.2	0.4	< 0.2	0.3
Chromium (Cr)	mg/kg	< 2	**MCERTS**	16	11	13	18	8
Chromium (hexavalent)	mg/kg	< 2	NONE	< 2	< 2	< 2	< 2	< 2
Copper (Cu)	mg/kg	< 4	**MCERTS**	20	11	10	18	8
Lead (Pb)	mg/kg	< 3	**MCERTS**	59	15	18	42	13
Mercury (Hg)	mg/kg	< 1	**MCERTS**	< 1	< 1	< 1	< 1	< 1
Nickel (Ni)	mg/kg	< 3	**MCERTS**	18	15	12	19	7
Selenium (Se)	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2	< 2	< 2
Vanadium (V)	mg/kg	< 1	**MCERTS**	27	16	21	31	12
Zinc (Zn)	mg/kg	< 3	**MCERTS**	122	32	93	91	40
Total Phenols (monohydric)	mg/kg	< 2	NONE	2.8	< 2	< 2	2.6	< 2
EPH (C10 - C40)	mg/kg	< 6	**MCERTS**		< 6		39	152

Analytical results are expressed on a dry weight basis where samples are assisted-dried at less than 30°C. The Method Description page describes if the test is performed on the dried or as-received portion
Subcontracted analysis (S)
(n) 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

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-07845	**Date Sampled**	15/06/23	15/06/23			
Tweedie Evans Consulting Limited t/a TEC	**Time Sampled**	None Supplied	None Supplied			
Site Reference: Woolley Green, Bradford-On-Avon	**TP / BH No**	TP01	TP03			
Project / Job Ref: 2305018.001	**Additional Refs**	None Supplied	None Supplied			
Order No: None Supplied	**Depth (m)**	0.30 - 0.40	0.20 - 0.30			
Reporting Date: 23/06/2023	**DETS Sample No**	657765	657767			

Determinand	Unit	RL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Phenanthrene	mg/kg	< 0.1	MCERTS	0.25	< 0.1			
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1			
Fluoranthene	mg/kg	< 0.1	MCERTS	0.78	0.15			
Pyrene	mg/kg	< 0.1	MCERTS	0.70	0.15			
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.56	0.14			
Chrysene	mg/kg	< 0.1	MCERTS	0.57	0.16			
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.96	0.24			
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.24	< 0.1			
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.76	0.20			
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.77	0.20			
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	0.19	< 0.1			
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.67	0.16			
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	6.5	< 1.6			

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - Speciated PAHs						
DETS Report No: 23-07845	**Date Sampled**	15/06/23	15/06/23	15/06/23		
Tweedie Evans Consulting Limited t/a TEC	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Woolley Green, Bradford-On-Avon	**TP / BH No**	TP02	TP04	TP05		
Project / Job Ref: 2305018.001	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	**Depth (m)**	0.10 - 0.20	0.50 - 0.60	0.20 - 0.30		
Reporting Date: 23/06/2023	**DETS Sample No**	657766	657768	657769		

Determinand	Unit	RL	Accreditation	(n)				
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Phenanthrene	mg/kg	< 0.1	MCERTS	< 0.1	0.19	< 0.1		
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.47	< 0.1		
Pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.42	< 0.1		
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.31	< 0.1		
Chrysene	mg/kg	< 0.1	MCERTS	< 0.1	0.32	< 0.1		
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.45	< 0.1		
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.17	< 0.1		
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.35	< 0.1		
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.32	< 0.1		
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1		
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.26	< 0.1		
Coronene	mg/kg	< 0.1	NONE	< 0.1	< 0.1	< 0.1		
Total Oily Waste PAHs	mg/kg	< 1	MCERTS	< 1	1.9	< 1		
Total Dutch 10 PAHs	mg/kg	< 1	MCERTS	< 1	2.4	< 1		
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	3.3	< 1.6		
Total WAC-17 PAHs	mg/kg	< 1.7	NONE	< 1.7	3.3	< 1.7		

(n) 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

DETS Ltd
Unit 1, Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Maidstone
Kent ME17 2JN
Tel : 01622 850410

Soil Analysis Certificate - TPH CWG Banded						
DETS Report No: 23-07845	**Date Sampled**	15/06/23	15/06/23	15/06/23		
Tweedie Evans Consulting Limited t/a TEC	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Woolley Green, Bradford-On-Avon	**TP / BH No**	TP02	TP04	TP05		
Project / Job Ref: 2305018.001	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	**Depth (m)**	0.10 - 0.20	0.50 - 0.60	0.20 - 0.30		
Reporting Date: 23/06/2023	**DETS Sample No**	657766	657768	657769		

Determinand	Unit	RL	Accreditation	(n)				
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aliphatic >C8 - C10	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2		
Aliphatic >C10 - C12	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2		
Aliphatic >C12 - C16	mg/kg	< 3	**MCERTS**	< 3	< 3	< 3		
Aliphatic >C16 - C21	mg/kg	< 3	**MCERTS**	< 3	< 3	< 3		
Aliphatic >C21 - C34	mg/kg	< 10	**MCERTS**	< 10	< 10	< 10		
Aliphatic (C5 - C34)	mg/kg	< 21	NONE	< 21	< 21	< 21		
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01		
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05		
Aromatic >C8 - C10	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2		
Aromatic >C10 - C12	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2		
Aromatic >C12 - C16	mg/kg	< 2	**MCERTS**	< 2	< 2	< 2		
Aromatic >C16 - C21	mg/kg	< 3	**MCERTS**	< 3	< 3	< 3		
Aromatic >C21 - C35	mg/kg	< 10	**MCERTS**	< 10	< 10	< 10		
Aromatic (C5 - C35)	mg/kg	< 21	NONE	< 21	< 21	< 21		
Total >C5 - C35	mg/kg	< 42	NONE	< 42	< 42	< 42		

(n) 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

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Soil Analysis Certificate - BTEX / MTBE						
DETS Report No: 23-07845	**Date Sampled**	15/06/23	15/06/23	15/06/23		
Tweedie Evans Consulting Limited t/a TEC	**Time Sampled**	None Supplied	None Supplied	None Supplied		
Site Reference: Woolley Green, Bradford-On-Avon	**TP / BH No**	TP02	TP04	TP05		
Project / Job Ref: 2305018.001	**Additional Refs**	None Supplied	None Supplied	None Supplied		
Order No: None Supplied	**Depth (m)**	0.10 - 0.20	0.50 - 0.60	0.20 - 0.30		
Reporting Date: 23/06/2023	**DETS Sample No**	657766	657768	657769		

Determinand	Unit	RL	Accreditation	(n)				
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5		
Ethylbenzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
p & m-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
o-xylene	ug/kg	< 2	MCERTS	< 2	< 2	< 2		
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5		

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Soil Analysis Certificate - Sample Descriptions	
DETS Report No: 23-07845	
Tweedie Evans Consulting Limited t/a TEC	
Site Reference: Woolley Green, Bradford-On-Avon	
Project / Job Ref: 2305018.001	
Order No: None Supplied	
Reporting Date: 23/06/2023	

DETS Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
657765	TP01	None Supplied	0.30 - 0.40	9.4	Brown sandy clay with stones
657766	TP02	None Supplied	0.10 - 0.20	12.2	Red sandy gravel with stones
657767	TP03	None Supplied	0.20 - 0.30	6.4	Grey sandy clay
657768	TP04	None Supplied	0.50 - 0.60	19.4	Brown sandy clay with stones and concrete
657769	TP05	None Supplied	0.20 - 0.30	5.4	Brown sandy clay with stones

Moisture content is part of procedure E003 & is not an accredited test
Insufficient Sample I/S
Unsuitable Sample U/S

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Soil Analysis Certificate - Methodology & Miscellaneous Information

DETS Report No: 23-07845
Tweedie Evans Consulting Limited t/a TEC
Site Reference: Woolley Green, Bradford-On-Avon
Project / Job Ref: 2305018.001
Order No: None Supplied
Reporting Date: 23/06/2023

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E009
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E011
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of water followed by electrometric measurement	E023
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by GC-MS	E020
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	EPH TEXAS (C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID for C8 to C40. C6 to C8 by headspace GC-MS	E004
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E009
Soil	D	Fraction Organic Carbon (FOC)	Determination of TOC by combustion analyser.	E027
Soil	D	Organic Matter (SOM)	Determination of TOC by combustion analyser.	E027
Soil	D	TOC (Total Organic Carbon)	Determination of TOC by combustion analyser.	E027
Soil	AR	Exchangeable Ammonium	Determination of ammonium by discrete analyser.	E029
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	D	Loss on Ignition @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Nitrate - Water Soluble (2:1)	Determination of nitrate by extraction with water & analysed by ion chromatography	E009
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E021
Soil	D	Phosphate - Water Soluble (2:1)	Determination of phosphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of sulphate by extraction with water & analysed by ion chromatography	E009
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	AR	Sulphide	Determination of sulphide by distillation followed by colorimetry	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia followed by ICP-OES	E024
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E011
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E010
Soil	AR	TPH CWG (ali: C5- C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C34, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C35. C5 to C8 by headspace GC-MS	E004
Soil	AR	TPH LQM (ali: C5-C6, C6-C8, C8-C10, C10-C12, C12-C16, C16-C35, C35-C44, aro: C5-C7, C7-C8, C8-C10, C10-C12, C12-C16, C16-C21, C21-C35, C35-C44)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge for C8 to C44. C5 to C8 by headspace GC-MS	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001
Soil	AR	VPH (C6-C8 & C8-C10)	Determination of hydrocarbons C6-C8 by headspace GC-MS & C8-C10 by GC-FID	E001

D Dried
AR As Received

Appendix D

Generic Quantitative Risk Assessment: Human Health

Project Number: 2305018.001		Lab Sample Number	657765	657766	657767	657768	657769				
Project Name: Woolley Green, Bradford-on-Avon		Sample Reference	TP01	TP02	TP03	TP04	TP05				
Site End Use:	*GAC (mg/kg)*	Sample Number									
Residential with homegrown produce		Depth (m)	0.30 - 0.40	0.10 - 0.20	0.20 - 0.30	0.50 - 0.60	0.20 - 0.30				
		Date Sampled	45092	45092	45092	45092	45092				
Determinand			1	2	3						
Arsenic	37[1]	mg/kg	13	12	20	12	9				
Boron	290[3]	mg/kg	1.6	< 1	< 1	1.3	< 1				
Cadmium	22[1]	mg/kg	0.2	< 0.2	0.4	< 0.2	0.3				
Chromium (total)	910[3]	mg/kg	16	11	13	18	8				
Chromium (VI)	21[1]	mg/kg	< 2	< 2	< 2	< 2	< 2				
Copper	2400[3]	mg/kg	20	11	10	18	8				
Lead	200[1]	mg/kg	59	15	18	42	13				
Mercury	40[2]	mg/kg	< 1	< 1	< 1	< 1	< 1				
Nickel	130[2]	mg/kg	18	15	12	19	7				
Selenium	350[2]	mg/kg	< 2	< 2	< 2	< 2	< 2				
Zinc	3700[3]	mg/kg	122	32	93	91	40				
Beryllium	1.7[3]	mg/kg	0.9	0.6	0.6	1	< 0.5				
Vanadium	410[3]	mg/kg	27	16	21	31	12				
Barium	1300[4]	mg/kg	228	54	667	128	287				
Cyanide (Total)	20[5]	mg/kg	< 1	< 1	< 1	< 1	< 1				
Phenol (Monohydric)	120[3]	mg/kg	2.8	< 2	< 2	2.6	< 2				
Sulphide	-	mg/kg	< 5	< 5	< 5	< 5	< 5				
Total Organic Carbon (TOC)	-	%	3.7	0.8	1.8	2.8	2.2				
Naphthalene	2.3[3]	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Acenaphthylene	170[3]	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Acenaphthene	210[3]	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Fluorene	170[3]	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Phenanthrene	95[3]	mg/kg	0.25	< 0.1	< 0.1	0.19	< 0.1				
Anthracene	2400[3]	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1				
Fluoranthene	280[3]	mg/kg	0.78	< 0.1	0.15	0.47	< 0.1				
Pyrene	620[3]	mg/kg	0.70	< 0.1	0.15	0.42	< 0.1				
Benzo(a)anthracene	7.2[3]	mg/kg	0.56	< 0.1	0.14	0.31	< 0.1				
Chrysene	15[3]	mg/kg	0.57	< 0.1	0.16	0.32	< 0.1				
Benzo(b)fluoranthene	2.6[3]	mg/kg	0.96	< 0.1	0.24	0.45	< 0.1				
Benzo(k)fluoranthene	77[3]	mg/kg	0.24	< 0.1	< 0.1	0.17	< 0.1				
Benzo(a)pyrene	2.2[3]	mg/kg	0.76	< 0.1	0.20	0.35	< 0.1				
Indeno(1,2,3-cd)pyrene	27[3]	mg/kg	0.77	< 0.1	0.20	0.32	< 0.1				
Dibenz(a,h)anthracene	0.24[3]	mg/kg	0.19	< 0.1	< 0.1	< 0.1	< 0.1				
Benzo(ghi)perylene	320[3]	mg/kg	0.67	< 0.1	0.16	0.26	< 0.1				
Speciated Total EPA-16 PAHs	-	mg/kg									
Benzene	0.087[3]	µg/kg		< 2		< 2	< 2				
Toluene	130[3]	µg/kg		< 5		< 5	< 5				
Ethylbenzene	47[3]	µg/kg		< 2		< 2	< 2				
p & m-xylene	56[3]	µg/kg		< 2		< 2	< 2				
o-xylene	60[3]	µg/kg		< 2		< 2	< 2				
MTBE (Methyl Tertiary Butyl Ether)	49[4]	µg/kg		< 5		< 5	< 5				
TPH Aliphatic C5 - C6	42[3]	mg/kg		< 0.01		< 0.01	< 0.01				
TPH Aliphatic C6 - C8	100[3]	mg/kg		< 0.05		< 0.05	< 0.05				
TPH Aliphatic C8 - C10	27[3]	mg/kg		< 2		< 2	< 2				
TPH Aliphatic C10 - C12	130[3]	mg/kg		< 2		< 2	< 2				
TPH Aliphatic C12 - C16	1100[3]	mg/kg		< 3		< 3	< 3				
TPH Aliphatic C16 - C21	65000[3]	mg/kg		< 3		< 3	< 3				
TPH Aliphatic C21 - C35	65000[3]	mg/kg		< 10		< 10	< 10				
TPH Aromatic C5 - C7	70[3]	mg/kg		< 0.01		< 0.01	< 0.01				
TPH Aromatic C7 - C8	130[3]	mg/kg		< 0.05		< 0.05	< 0.05				
TPH Aromatic C8 - C10	34[3]	mg/kg		< 2		< 2	< 2				
TPH Aromatic C10 - C12	74[3]	mg/kg		< 2		< 2	< 2				
TPH Aromatic C12 - C16	140[3]	mg/kg		< 2		< 2	< 2				
TPH Aromatic C16 - C21	260[3]	mg/kg		< 3		< 3	< 3				
TPH Aromatic C21 - C35	1100[3]	mg/kg		< 10		< 10	< 10				

Notes:

[1] DEFRA C4SLs (2014)

[2] Environment Agency SGVs (2009)

[3] LQM/CIEH S4ULs (2015)

[4] CL:AIRE, AGS & EIS (2009)

[5] Dutch Intervention Value for free cyanide (VROM 2000)

*All GACs based on a sandy soil and Soil Organic Matter (SOM) of 1% where applicable.

Concentration does not exceed GAC

Concentration exceeds GAC

No set GAC