

Our Ref: BEK/19661/211027/CGL/P42

27 October 2021

FAO Paul Hunter
The Casey Group
Rydings Road
Rochdale
OL12 9PS

Dear Paul,

Residential Development at Ilk Street and Alpine Street, Clayton- PLOT 42

BEK Enviro (BEK) has been commissioned by The Casey Group (CG) to supervise and validate the remediation works required at the above site.

The approved remediation works are detailed in the BEK Report entitled 'Remediation Method Statement' (Report Ref BEK-19661-1 (Rev D)), dated December 2019.

Clean Cover System

The approved remediation requirement comprise the installation of a clean cover system in private gardens and soft landscaped areas as follows:

'The gardens within Plots 26 to 62 will need to be capped with a minimum of 600 mm of clean suitable soils (minimum 450 mm topsoil overlying 150 mm subsoil). Any soft landscaped areas in the vicinity of Plots 26 to 62 will need to be capped with a minimum of 450 mm of clean suitable soils. Soils used in the capping system will need to be tested and assessed and ensure suitability for use. The soils will be placed on a geo-membrane to act as a marker layer and prevent mixing. Final capping thickness will also need to be validated.'

To comply with the above recommendations, CG have imported subsoil from Shire Hill Quarry, Glossop. Source testing has been carried out by BEK to confirm suitability (SS-1 to SS-3). Subsoil source test data is presented in Annex A). To ensure consistency, BEK recovered an additional 6 validation samples (VS-SS1 to VS-SS6) of subsoil from the rear garden following formation of the capping layer. There is no formal requirement to test virgin quarried material. However, BEK will maintain a watch brief on the subsoil and take periodic samples at the discretion of our own engineers to ensure visual and chemical consistency of the material.

The topsoil has been sourced the topsoil from Frank O'Gara & Sons from Protos, Ince Marshes in Ellesmere Port. Source test data for the topsoil is presented in Annex A. To ensure consistency, BEK recovered additional validation samples (VS-TS1 to VS-TS10) of topsoil from the rear garden following formation of the capping layer. The most recent results (VS-TS8 to VS-TS10) are included within Annex B.



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

bEk Enviro Ltd

Suite One | No 3 Mitton Road Business Park
Mitton Road | Whalley | Lancashire | BB7 9YE

01254 377622

mbuckley@bekenviro.co.uk | bekenviro.co.uk

All imported samples recovered by BEK at the Ilk Street and Alpine Street, Clayton site were submitted to the UKAS accredited laboratories of Envirolab and chemically tested for a wide range of potential contaminants of concern. Copies of the chemical test results are presented in Annex B. All available chemical test results have been compared to approved assessment criteria (as presented in the Remediation Strategy) and BEK can confirm that the sub/topsoil is suitable for use in a residential garden.

Following placement of the validated soils by CG, an engineer from BEK carried out spot checks and can confirm that the capping layer for Plot 42 comprises in excess of 600 mm of suitably clean validated soils. The capping soils overly a geotextile membrane at the base. Photographs showing capping thickness are provided within Annex E.

Gas Mitigation Measures

In addition to the clean cover system, risks from ground gas have been identified in the north of the site. As such, gas mitigation measures in accordance with Characteristic Situation 2/Amber 1 need to be installed in Plots 42 to 58.

The gas measures recommended will comply with those recommended for 'Amber 1' sites, as described in CIRIA 665. The measures will include an independently validated membrane and passively ventilated sub-floor void. Gas protection measures will be as described in BRE Report 414 and ventilation of the sub-floor will need to facilitate a minimum of one complete volume change per 24 hours.

The sub-floor void and the installation of the membrane has been validated and BEK can confirm the gas measures incorporated into the foundation design of Plot 42 conforms to the specified requirements. The membrane installation was verified by an Engineer from BEK who has attended the Verification of Gas Protection Systems Course delivered by CL:AIRE Training Course.

CG commissioned Reeve-Tec Membranes Limited to install the gas membranes at the site, who have used the Protech GM Super gas membrane which is considered suitable for use. A copy of the data sheet for this membrane is presented in Annex C. The completed gas validation proforma for this plot is presented in Annex D and validation photographs are presented in Annex E.

BEK can confirm that the remediation works required for Plot 42 at the Residential Development at Ilk Street, Clayton have been completed in accordance with the approved methodology.

I trust the above is satisfactory. Should you require anything further please do not hesitate to contact the undersigned.

Yours sincerely

MICHAEL BUCKLEY

BSc (Hons) MSc MEnvSci CEnv

ANNEX A

Source Test Data

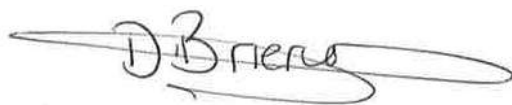
FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/00719
Issue Number: 1
Date: 03 February, 2021

Client: BEK Enviro Ltd
Suite One
No 3 Mitton Road Business Park
Mitton Road
Whalley
Lancashire
BB7 9YE

Project Manager: Mick Buckley
Project Name: Shire Hill Quarry - Source Test Data - Subsoil
Project Ref: Not specified
Order No: 6981/20685/J
Date Samples Received: 26/01/21
Date Instructions Received: 26/01/21
Date Analysis Completed: 03/02/21

Prepared by:



Danielle Brierley
Client Manager

Approved by:



Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 21/00719

Client Project Name: Shire Hill Quarry - Source Test Data - Subsoil

Client Project Ref: Not specified

Lab Sample ID	21/00719/1	21/00719/2	21/00719/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS-1	SS-2	SS-3							
Depth to Top										
Depth To Bottom										
Date Sampled	26-Jan-21	26-Jan-21	26-Jan-21							
Sample Type	Soil	Soil	Soil							
Sample Matrix Code	2A	4A	4A							
% Stones >10mm _A	28.3	26.8	25.0					% w/w	0.1	A-T-044
pH _D ^{M#}	5.36	5.27	6.01					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	0.02	<0.01					g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	<200	<200	<200					mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	0.4	0.4	0.5					% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	<1	<1	<1					mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	<0.5	<0.5	<0.5					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	2	1	4					mg/kg	1	A-T-024s
Chromium _D ^{M#}	13	12	14					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	7	7	8					mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	13	12	15					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	45	42	47					mg/kg	5	A-T-024s

Envirolab Job Number: 21/00719

Client Project Name: Shire Hill Quarry - Source Test Data - Subsoil

Client Project Ref: Not specified

Lab Sample ID	21/00719/1	21/00719/2	21/00719/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	SS-1	SS-2	SS-3							
Depth to Top										
Depth To Bottom										
Date Sampled	26-Jan-21	26-Jan-21	26-Jan-21							
Sample Type	Soil	Soil	Soil							
Sample Matrix Code	2A	4A	4A							
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	0.04					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	0.03					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	<0.07					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	<0.08	<0.08					mg/kg	0.01	A-T-019s

REPORT NOTES

General

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

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	BEK Enviro Ltd, Suite One , No 3 Mitton Road Business Park , Mitton Road , Whalley , Lancashire , BB7 9YE	Project No:	21/00719
Project:	Shire Hill Quarry - Source Test Data - Subsoil	Date Received:	26/01/2021 (am)
Clients Project No:		Cool Box Temperatures (°C):	5.4

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/04268
Issue Number: 1
Date: 06 May, 2021

Client: Frank O'Gara & Sons Ltd,
Sorby Road,
Northbank
Irlam
Manchester
UK
M44 5BA

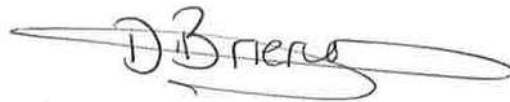
Project Manager: John O'Gara/Keith Lewis
Project Name: Protos, E'Port
Project Ref: N/A
Order No: PP57816
Date Samples Received: 21/04/21
Date Instructions Received: 22/04/21
Date Analysis Completed: 05/05/21

Prepared by:



Melanie Marshall
Laboratory Coordinator

Approved by:



Danielle Brierley
Client Manager

Envirolab Job Number: 21/04268

Client Project Name: Protos, E'Port

Client Project Ref: N/A

Lab Sample ID	21/04268/1	21/04268/2	21/04268/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	Topsoil 1	Topsoil 2	Topsoil 3							
Depth to Top										
Depth To Bottom										
Date Sampled	21-Apr-21	21-Apr-21	21-Apr-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	4AE	4AE							
% Stones >10mm _A	3.8	7.3	<0.1					% w/w	0.1	A-T-044
pH _D ^{M#}	6.73	6.60	6.74					pH	0.01	A-T-031s
Ammonia / Ammoniacal Nitrogen as NH ₃ _D	14.6	20.1	15.7					mg/kg	0.24	A-T-033s
Chloride (water sol 2:1) _D ^{M#}	<10	<10	<10					mg/kg	10	A-T-026s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	<0.01	<0.01					g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	340	340	360					mg/kg	200	A-T-028s
Cyanide (free) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sFCN
Arsenic _D ^{M#}	3	3	3					mg/kg	1	A-T-024s
Cadmium _D ^{M#}	<0.5	<0.5	<0.5					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	13	12	13					mg/kg	1	A-T-024s
Chromium _D ^{M#}	15	15	16					mg/kg	1	A-T-024s
Lead _D ^{M#}	26	20	22					mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	11	10	10					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	35	32	35					mg/kg	5	A-T-024s
TPH total (>C6-C40) _A ^{M#}	25	48	59					mg/kg	10	A-T-007s

Envirolab Job Number: 21/04268

Client Project Name: Protos, E'Port

Client Project Ref: N/A

Lab Sample ID	21/04268/1	21/04268/2	21/04268/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	Topsoil 1	Topsoil 2	Topsoil 3							
Depth to Top										
Depth To Bottom										
Date Sampled	21-Apr-21	21-Apr-21	21-Apr-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	4AE	4AE							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 21/04268

Client Project Name: Protos, E'Port

Client Project Ref: N/A

Lab Sample ID	21/04268/1	21/04268/2	21/04268/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	Topsoil 1	Topsoil 2	Topsoil 3							
Depth to Top										
Depth To Bottom										
Date Sampled	21-Apr-21	21-Apr-21	21-Apr-21							
Sample Type	Soil - ES	Soil - ES	Soil - ES							
Sample Matrix Code	4AE	4AE	4AE							
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	<0.07					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	<0.08	<0.08					mg/kg	0.01	A-T-019s

REPORT NOTES

General

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

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	Frank O'Gara & Sons Ltd, Sorby Road, Northbank, Irlam, Manchester, UK, M44	Project No:	21/04268
	5BA	Date Received:	22/04/2021 (am)
Project:	Protos, E'Port	Cool Box Temperatures (°C):	14.9
Clients Project No:	N/A		

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

ANNEX B

Validation Chemical Test Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/09690
Issue Number: 1

Date: 17 September, 2021

Client: BEK Enviro Ltd
Suite One
No 3 Mitton Road Business Park
Mitton Road
Whalley
Lancashire
BB7 9YE

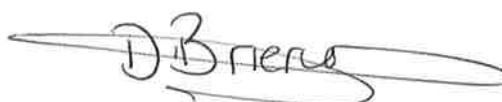
Project Manager: Mick Buckley
Project Name: Ilk Street, Clayton
Project Ref: Not specified
Order No: 7221-19661-M
Date Samples Received: 07/09/21
Date Instructions Received: 07/09/21
Date Analysis Completed: 17/09/21

Prepared by:



Richard Wong
Client Manager

Approved by:



Danielle Brierley
Client Manager

Envirolab Job Number: 21/09690

Client Project Name: Ilk Street, Clayton

Client Project Ref: Not specified

Lab Sample ID	21/09690/1	21/09690/2	21/09690/3	21/09690/4	21/09690/5	21/09690/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-SS1	VS-SS2	VS-SS3	VS-SS4	VS-SS5	VS-SS6				
Depth to Top										
Depth To Bottom										
Date Sampled	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21				
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid				
Sample Matrix Code	7	7	7	7	7	7				
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		% w/w	0.1	A-T-044
pH _D ^{M#}	7.21	6.80	6.83	6.50	6.60	6.72		pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	0.03	0.08	0.09	0.08	0.05		g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	1000	850	880	1100	880	730		mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	5.4	5.7	4.1	4.4	4.2	4.6		% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	6	9	4	2	2	6		mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0		mg/kg	1	A-T-027s
Cadmium _D ^{M#}	1.6	1.4	1.3	1.3	1.4	1.4		mg/kg	0.5	A-T-024s
Copper _D ^{M#}	56	51	45	49	52	52		mg/kg	1	A-T-024s
Chromium _D ^{M#}	28	33	25	26	28	24		mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-040s
Lead _D ^{M#}	38	30	27	34	33	29		mg/kg	1	A-T-024s
Mercury _D	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17		mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	51	59	45	47	49	46		mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-024s
Zinc _D ^{M#}	109	119	96	95	98	100		mg/kg	5	A-T-024s

Envirolab Job Number: 21/09690

Client Project Name: Ilk Street, Clayton

Client Project Ref: Not specified

Lab Sample ID	21/09690/1	21/09690/2	21/09690/3	21/09690/4	21/09690/5	21/09690/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-SS1	VS-SS2	VS-SS3	VS-SS4	VS-SS5	VS-SS6				
Depth to Top										
Depth To Bottom										
Date Sampled	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21				
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid				
Sample Matrix Code	7	7	7	7	7	7				
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD	NAD	NAD	NAD				A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A	N/A	N/A	N/A				A-T-045

Envirolab Job Number: 21/09690

Client Project Name: Ilk Street, Clayton

Client Project Ref: Not specified

Lab Sample ID	21/09690/1	21/09690/2	21/09690/3	21/09690/4	21/09690/5	21/09690/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-SS1	VS-SS2	VS-SS3	VS-SS4	VS-SS5	VS-SS6				
Depth to Top										
Depth To Bottom										
Date Sampled	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21				
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid				
Sample Matrix Code	7	7	7	7	7	7				
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	0.02		mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	<0.02	<0.02	0.02		mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	0.15		mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	0.18		mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	0.18		mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	0.09		mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07		mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06	<0.06	<0.06	0.20		mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04		mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08	<0.08	<0.08	0.26		mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	0.01		mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	0.10		mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.08	0.07	0.06	0.06	0.06	0.13		mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	0.25		mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	0.08	<0.08	<0.08	<0.08	<0.08	1.59		mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/09690

Client Project Name: Ilk Street, Clayton

Client Project Ref: Not specified

Lab Sample ID	21/09690/1	21/09690/2	21/09690/3	21/09690/4	21/09690/5	21/09690/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-SS1	VS-SS2	VS-SS3	VS-SS4	VS-SS5	VS-SS6				
Depth to Top										
Depth To Bottom										
Date Sampled	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21	06-Sep-21				
Sample Type	Solid	Solid	Solid	Solid	Solid	Solid				
Sample Matrix Code	7	7	7	7	7	7				
TPH CWG										
Ali >C5-C6 _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	5	5	4	4	4	2		mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	13	15	14	14	12	5		mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	29	39	34	37	32	13		mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	26	37	32	34	30	10		mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	36	45	44	43	40	20		mg/kg	1	A-T-055s
Total Aliphatics _A	109	140	129	131	119	50		mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	2	2	2	2	2	1		mg/kg	1	A-T-055s
Aro >C10-C12 _A	4	4	4	4	3	2		mg/kg	1	A-T-055s
Aro >C12-C16 _A	8	10	9	9	8	4		mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	7	9	8	8	7	5		mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	8	12	11	11	10	21		mg/kg	1	A-T-055s
Total Aromatics _A	30	38	36	35	31	34		mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	140	178	164	166	150	84		mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		mg/kg	0.01	A-T-022s

REPORT NOTES

General

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

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: BEK Enviro Ltd, Suite One , No 3 Mitton Road Business Park , Mitton Road ,
Whalley , Lancashire , BB7 9YE

Project: Ilk Street, Clayton

Clients Project No:

Project No: 21/09690

Date Received: 07/09/2021 (am)

Cool Box Temperatures (°C): 20.6

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^{\circ}\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	21/09690/1	21/09690/2	21/09690/3	21/09690/4	21/09690/5	21/09690/6
Client Sample No						
Client Sample ID/Depth	VS-SS1	VS-SS2	VS-SS3	VS-SS4	VS-SS5	VS-SS6
Date Sampled	06/09/21	06/09/21	06/09/21	06/09/21	06/09/21	06/09/21
A-T-019s	14/09/2021	14/09/2021	14/09/2021	14/09/2021	14/09/2021	14/09/2021
A-T-022s	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021
A-T-024s	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021
A-T-026s	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021
A-T-027s	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021
A-T-028s	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021	17/09/2021
A-T-031s	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021
A-T-032 OM	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021
A-T-040s	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021
A-T-042sTCN	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021	10/09/2021
A-T-044	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021	15/09/2021
A-T-045	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021	09/09/2021
A-T-050s	11/09/2021	11/09/2021	11/09/2021	11/09/2021	11/09/2021	11/09/2021
A-T-055s	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021	16/09/2021

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 21/10947
Issue Number: 1

Date: 18 October, 2021

Client: BEK Enviro Ltd
Suite One
No 3 Mitton Road Business Park
Mitton Road
Whalley
Lancashire
BB7 9YE

Project Manager: Mick Buckley
Project Name: Ilk Street, Clayton
Project Ref: N/A
Order No: 7265-19661-J
Date Samples Received: 07/10/21
Date Instructions Received: 08/10/21
Date Analysis Completed: 18/10/21

Prepared by:



Sophie France
Client Service Manager

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 21/10947

Client Project Name: Ilk Street, Clayton

Client Project Ref: N/A

Lab Sample ID	21/10947/1	21/10947/2	21/10947/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-TS-8	VS-TS-9	VS-TS-10							
Depth to Top										
Depth To Bottom										
Date Sampled	06-Oct-21	06-Oct-21	06-Oct-21							
Sample Type	Soil	Soil	Soil							
Sample Matrix Code	6AE	6AE	6AE							
% Stones >10mm _A	0.6	0.9	0.6					% w/w	0.1	A-T-044
pH _D ^{M#}	7.13	7.22	7.18					pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	<0.01	<0.01					g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	770	750	890					mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2					mg/kg	0.2	A-T-050s
Organic matter _D ^{M#}	7.9	11.0	12.0					% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	15	14	17					mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0					mg/kg	1	A-T-027s
Cadmium _D ^{M#}	0.8	0.8	0.9					mg/kg	0.5	A-T-024s
Copper _D ^{M#}	52	48	56					mg/kg	1	A-T-024s
Chromium _D ^{M#}	17	17	18					mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1					mg/kg	1	A-T-040s
Lead _D ^{M#}	83	82	89					mg/kg	1	A-T-024s
Mercury _D	0.30	0.18	<0.17					mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	14	15	16					mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	2	<1					mg/kg	1	A-T-024s
Zinc _D ^{M#}	72	70	80					mg/kg	5	A-T-024s

Envirolab Job Number: 21/10947

Client Project Name: Ilk Street, Clayton

Client Project Ref: N/A

Lab Sample ID	21/10947/1	21/10947/2	21/10947/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-TS-8	VS-TS-9	VS-TS-10							
Depth to Top										
Depth To Bottom										
Date Sampled	06-Oct-21	06-Oct-21	06-Oct-21							
Sample Type	Soil	Soil	Soil							
Sample Matrix Code	6AE	6AE	6AE							
Asbestos in Soil (inc. matrix)										
Asbestos in soil [#]	NAD	NAD	NAD							A-T-045
Asbestos ACM - Suitable for Water Absorption Test? _D	N/A	N/A	N/A							A-T-045

Envirolab Job Number: 21/10947

Client Project Name: Ilk Street, Clayton

Client Project Ref: N/A

Lab Sample ID	21/10947/1	21/10947/2	21/10947/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-TS-8	VS-TS-9	VS-TS-10							
Depth to Top										
Depth To Bottom										
Date Sampled	06-Oct-21	06-Oct-21	06-Oct-21							
Sample Type	Soil	Soil	Soil							
Sample Matrix Code	6AE	6AE	6AE							
PAH-16MS										
Acenaphthene _A ^{M#}	0.07	0.10	0.06					mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	0.10	0.15	0.07					mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	0.45	0.57	0.33					mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.55	0.54	0.36					mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.59	0.60	0.42					mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.28	0.25	0.17					mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	0.25	0.24	0.15					mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.62	0.67	0.45					mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04					mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	0.87	1.12	0.67					mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	0.04	0.04	0.03					mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.32	0.31	0.21					mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03					mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.42	0.65	0.29					mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.83	1.01	0.63					mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	5.39	6.25	3.84					mg/kg	0.01	A-T-019s

Envirolab Job Number: 21/10947

Client Project Name: Ilk Street, Clayton

Client Project Ref: N/A

Lab Sample ID	21/10947/1	21/10947/2	21/10947/3					Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	VS-TS-8	VS-TS-9	VS-TS-10							
Depth to Top										
Depth To Bottom										
Date Sampled	06-Oct-21	06-Oct-21	06-Oct-21							
Sample Type	Soil	Soil	Soil							
Sample Matrix Code	6AE	6AE	6AE							
TPH CWG										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	<1					mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	1	1	1					mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	18	19	18					mg/kg	1	A-T-055s
Total Aliphatics _A	20	21	20					mg/kg	1	A-T-055s
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	3	3	1					mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1					mg/kg	1	A-T-055s
Aro >C12-C16 _A	3	3	3					mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	8	7	7					mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	39	33	36					mg/kg	1	A-T-055s
Total Aromatics _A	53	46	47					mg/kg	1	A-T-055s
TPH (Ali & Aro >C5-C35) _A	73	67	67					mg/kg	1	A-T-055s
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01					mg/kg	0.01	A-T-022s

REPORT NOTES

General

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

The results reported herein relate only to the material supplied to the laboratory.

The residue of any samples contained within this report, and any received with the same delivery, will be disposed of six weeks after initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of six months after the initial Asbestos testing is completed.

Analytical results reflect the quality of the sample at the time of analysis only.

Opinions and interpretations expressed are outside the scope of our accreditation.

If results are in italic font they are associated with an AQC failure, these are not accredited and are unreliable.

A deviating samples report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.

The Client Sample No, Client Sample ID, Depth to Top, Depth to Bottom and Date Sampled were all provided by the client.

Soil chemical analysis:

All results are reported as dry weight (<40°C).

For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts

All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

TPH analysis of water by method A-T-007:

Free and visible oils are excluded from the sample used for analysis so that the reported result represents the dissolved phase only.

Electrical Conductivity of water by Method A-T-037:

Results greater than 12900µS/cm @ 25°C / 11550µS/cm @ 20°C fall outside the calibration range and as such are unaccredited.

Asbestos:

Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.

Stones etc. are not removed from the sample prior to analysis.

Quantification of asbestos is a 3 stage process including visual identification, hand picking and weighing and fibre counting by sedimentation/phase contrast optical microscopy if required. If asbestos is identified as being present but is not in a form that is suitable for analysis by hand picking and weighing (normally if the asbestos is present as free fibres) quantification by sedimentation is performed. Where ACMs are found a percentage asbestos is assigned to each with reference to 'HSG264, Asbestos: The survey guide' and the calculated asbestos content is expressed as a percentage of the dried soil sample aliquot used.

Predominant Matrix Codes:

1 = SAND, 2 = LOAM, 3 = CLAY, 4 = LOAM/SAND, 5 = SAND/CLAY, 6 = CLAY/LOAM, 7 = OTHER, 8 = Asbestos bulk ID sample, 9 = INCINERATOR ASH.

Samples with Matrix Code 7 & 8 are not predominantly a SAND/LOAM/CLAY mix and are not covered by our BSEN 17025 or MCERTS accreditations, with the exception of bulk asbestos which are BSEN 17025 accredited.

Secondary Matrix Codes:

A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal,

E = contains roots/twigs.

Key:

IS indicates Insufficient Sample for analysis.

US indicates Unsuitable Sample for analysis.

NDP indicates No Determination Possible.

NAD indicates No Asbestos Detected.

N/A indicates Not Applicable.

Superscript # indicates method accredited to ISO 17025.

Superscript "M" indicates method accredited to MCERTS.

Subscript "A" indicates analysis performed on the sample as received.

Subscript "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve

Please contact us if you need any further information.

Envirolab Deviating Samples Report

Units 7&8 Sandpits Business Park, Mottram Road, Hyde, SK14 3AR
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client:	BEK Enviro Ltd, Suite One , No 3 Mitton Road Business Park , Mitton Road , Whalley , Lancashire , BB7 9YE	Project No:	21/10947
Project:	Ilk Street, Clayton	Date Received:	08/10/2021 (am)
Clients Project No:	N/A	Cool Box Temperatures (°C):	16.0

NO DEVIATIONS IDENTIFIED with respect to sampling dates or containers received.

Note: If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3 (for water samples $5 \pm 3^{\circ}\text{C}$), ISO 18400-105:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

Envirolab Analysis Dates

Lab Sample ID	21/10947/1	21/10947/2	21/10947/3
Client Sample No			
Client Sample ID/Depth	VS-TS-8	VS-TS-9	VS-TS-10
Date Sampled	06/10/21	06/10/21	06/10/21
A-T-019s	12/10/2021	12/10/2021	12/10/2021
A-T-022s	14/10/2021	14/10/2021	14/10/2021
A-T-024s	15/10/2021	15/10/2021	15/10/2021
A-T-026s	14/10/2021	14/10/2021	14/10/2021
A-T-027s	14/10/2021	14/10/2021	14/10/2021
A-T-028s	15/10/2021	15/10/2021	15/10/2021
A-T-031s	18/10/2021	18/10/2021	18/10/2021
A-T-032 OM	17/10/2021	17/10/2021	17/10/2021
A-T-040s	14/10/2021	14/10/2021	14/10/2021
A-T-042sTCN	15/10/2021	15/10/2021	15/10/2021
A-T-044	13/10/2021	13/10/2021	13/10/2021
A-T-045	12/10/2021	12/10/2021	12/10/2021
A-T-050s	13/10/2021	13/10/2021	13/10/2021
A-T-055s	14/10/2021	14/10/2021	14/10/2021

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

End of Report

ANNEX C

Gas Membrane Data Sheet

Protech GM Super

GAS PROTECTION

• HIGH RISK CHARACTERISTIC SITES •

REGULATIONS COMPATIBILITY TABLE

	CIRIA 665 CHARACTERISTIC SITUATION 2	CIRIA 665 CHARACTERISTIC SITUATION 3-6	BS8485 CHARACTERISTIC SITUATION 2	BS8485 CHARACTERISTIC SITUATION 3-6	BRE 211 RADON	NHBC AMBER 1	NHBC AMBER 2 & RED
METHANE	✓	✓	✓	✓	N/A	✓	✓
CARBON DIOXIDE	✓	✓	✓	✓	N/A	✓	✓
RADON	N/A	N/A	N/A	N/A	✓	N/A	N/A

DESCRIPTION

Protech GM Super is a high performance proprietary reinforced gas barrier; that incorporates a 12 micron aluminium foil layer, for maximum protection against ground-borne gases. This has been specifically designed to conform with the latest guidance documents. Due to its unique composition, the membrane is extremely robust and flexible and, therefore, easy to install on site. The membrane also provides protection from damp when placed below the slab and, therefore, there is no need to install a separate DPM.

SPECIFICATION

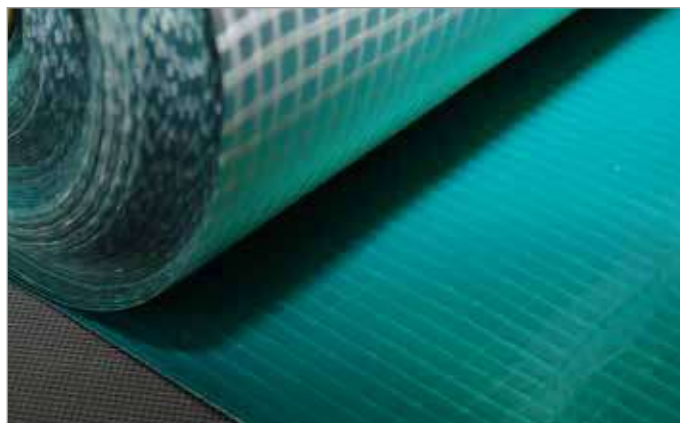
CIRIA C665, BS8485:2015 & Local Authority Ground Gas Handbook recommended that gas membranes are specified on the basis of the 'need to survive' construction, i.e. use one that is puncture and tear resistant.

Thickness should not be the main determinant of the suitability of a membrane for a particular site, although it can indirectly influence some key performance parameters.

In practise, because of the nature of construction sites, the durability, survivability and robustness of membranes are equally important than purely permeability to gas.

Protech GM Super incorporates a reinforced grid to ensure that maximum protection is achieved when installed to manufacturers' instructions.

The need for high quality workmanship during installation should not be under-estimated. The health and safety of the occupants of the building is dependent on its satisfactory performance. If installed incorrectly or damaged during the construction process, the membrane is rendered ineffective and will fail to provide adequate protection against the ingress of ground gas or vapours.



TYPICAL PROPERTIES

Roll Length	50m
Width	2m
Weight	370g/m ²
Thickness	0.4mm
Colour	Green / Silver
Methane Permeability (ISO 15105-1)	≤ 0.1 ml/day/m ²

REQUIRED ACCESSORIES

- Protech GM Super Starter Band (1m x 50m)
- Protech GM Tape
- Protech GM Tophats
- Protech SAGM (Self Adhesive Gas Membrane)
- Protech GM Flashing Strip
- Protech GM Super Corner Units
- Protech GM Primer
- Protech GM 3mm Protection Board
- Protech GM Protection Fleece
- Protech I25

VENTING

On sites where venting is required, our Provoid Venting System should be used. We can provide design advice for both passive and active venting systems to suit individual site requirements.

Protech GM Super Starter Band

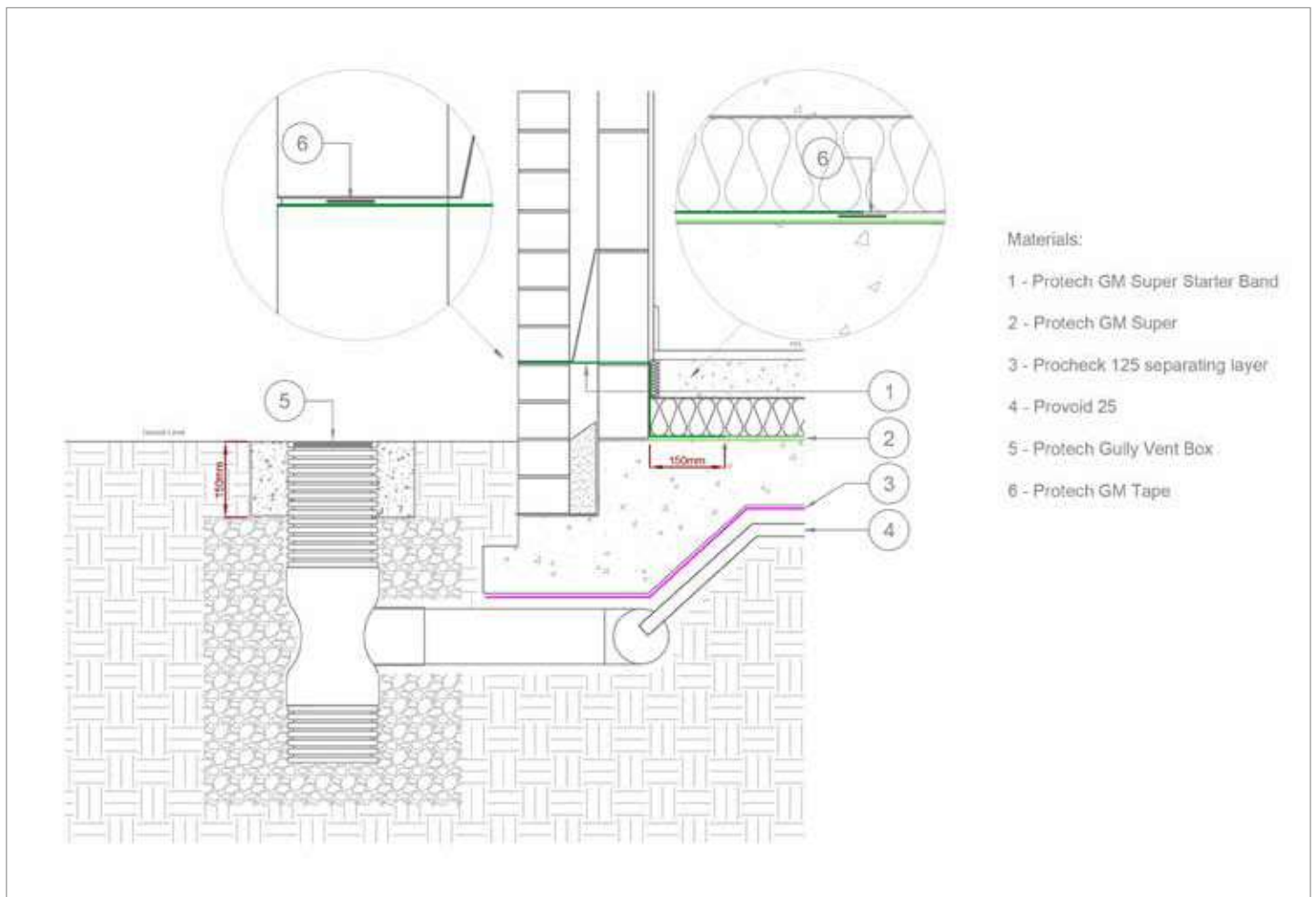
GAS PROTECTION

DESCRIPTION

The Protech GM Super Starter Band has a dual function, to provide a continuous barrier to gas which is then linked in with the horizontal gas membrane and it will also function as a DPC within the wall.

The Starter Band goes through the cavity with an architectural DPC or cavity tray which should be fixed with Protech GMTape in order to stop a creation of a slip plane.

On a solid wall internal wall construction there is no requirement for any additional DPC or protection to the Starter Band. When used in a cavity wall a separate cavity tray or architectural DPC is recommended to protection the spanning section of the Starter Band from damage from mortar spots and other debris created during construction. This cavity tray would be installed in the same course and fixed to Protech GMTape again to prevent a creation of a slip plane.



Download a full Gas Protection brochure from our website...

www.proctorgroup.com

contact@proctorgroup.com | +44 (0) 1250 872261

Revised June 2019



ANNEX D

Gas Proforma

GAS PROTECTION VALIDATION RECORD:

Ilk Street and Alpine Street, Clayton Residential Development



PLOT 42

One record sheet to be completed for each plot inspected by a suitably qualified independent consultant/engineer

Job No	19661	Design/specification ref	BEK RMS dated December 2019 (BEK-19661-1 (Rev D))		
Site Name	Ilk Street and Alpine Street	Building use	Residential/ commercial/other		
Plot No	42	Building description	Detached/ semi-detached/terrace/apartment		
Compiled	D Emmott	Gas protection type	Active/passive	Foundation type	Suspended floor/ raft/other

Ventilated sub floor (if present)	Inspection date/type:	January 2021	Inspected by	BEK	Photographed	Y/ N
-----------------------------------	-----------------------	--------------	--------------	-----	--------------	-----------------

		notes/comments (see guide below)
Void former type	Y / N	1. Not required - open void space
Height of void space	Y/ N	2. Minimum 150 mm
Gravel type	Y / N	3. Not required - open space
Pipe size and spacing	Y/ N	4. Minimum 2 m spacing where required
External wall air bricks	Y/ N	5. 2 m centres - all clear and unobstructed
Internal sleeper walls	Y/ N	6. Joints in masonry allow free venting
External vent trenches/ducts	Y / N	7. Not required

Gas barrier	Inspection date/type:	February 2021	Inspected by	BEK	Photographed	Y/ N
-------------	-----------------------	---------------	--------------	-----	--------------	-----------------

		notes/comments (see guide below)
Membrane type	Y/ N	8. Protech GM Super
Extent of coverage	Y/ N	9. Full ground floor
Underside of membrane	Y/ N	10. Good conditions - All rips/tears sealed using tape
Slab/membrane condition	Y/ N	11. Free from debris - good condition
Laps and joints	Y/ N	12. All laps and joined sealed correctly using tape
Damp-proof membrane	Y/ N	13. OK
Service entries and seals	Y/ N	14. All sealed appropriately using tape
Cavity inspection	Y/ N	15. Membrane crosses cavity - cavity clear of obstructions

GAS PROTECTION VALIDATION RECORD:

Ilk Street and Alpine Street, Clayton Residential Development

PLOT 42



Guide Notes

1.	Void former height	Proprietary type – manufacturer and specification, in accordance with design? Installed property without damage
2.	Height of void space	Height of proprietary former of constructed ventilated space below suspended floor – note any debris on void/obstructions to air flow, note formation surface soil type (eg crushed concrete/brick), evidence of flooding
3.	Gravel type	Gravel type if used (limestone/granite etc) and any specification (eg 6F2), typical particle dimensions (mm), apparent fines content (low/high), compaction (loose/dense), waterlogging/contamination by clay, organic matter, other debris. Take photographs of stockpile or check details on delivery notes. Check depth of stone conforms to at least 300 mm if visible
4.	Pipe size and spacing	Diameter in mm; material type (eg PVC); slotted or perforated; positioning and spacing/separation and jointing as on design drawing – if not sketch arrangement – do pipes connect with external (telescopic/swan neck) vents? Take photographs of vents on external walls for each plot.
5.	External wall airbricks	Check numbers, size and positions as design drawing – check for blockage eg mortar, soil, pavings etc
6.	Internal wall airbricks	Check ventilation holes eg honeycomb brickwork or pipe crossings – note size, spacing and location
7.	External vent trenches/ducts	Check whether located and constructed in accordance with design drawings; if open-topped gravel, note gravel type and presence of fines/contamination; if pipe or other vents – check positions and construction for functionality and absence of blockages – vents may be built over
8.	Membrane type	Note manufacturer and product specification, including batch/roll numbers if present – in accordance with specification? Check stock storage arrangements – protected from dirt and damage
9.	Extent of coverage	If membrane cover is incomplete then further inspection will be required – note areas completed/incomplete – is membrane fully visible or have internal walls been constructed over membrane/screed placed?
10.	Underside of membrane	Where necessary, for example, when using a granular blanket as a ventilation layer, check the underside of the membrane has adequate protection eg minimum 50 mm no fines concrete blinding layer or appropriate geo-textile
11.	Slab/membrane condition	Record presence of ducts/rough surfaces, in particular sharp projections, below or above membrane; record locations of all punctures or repairs, note arrangements to protect membrane surface from traffic/tools and equipment/materials and temporary weighting down of membrane eg use of boards. Take photographs of each plot inspected.



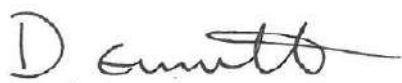
GEO-ENVIRONMENTAL CONSULTING ENGINEERS

12.	Laps and joints	Check that all joints are lapped and sealed in accordance with manufacturer's requirements/specification, particular where creases/folds are present (usually minimum 150 mm laps with double-sided tape between sheets and single sided tape on top surface; note size of sheets and frequency of edge seals). Take photographs of jointing for each plot
13.	Damp-proof course	Record DPC manufacturer and product code - usually integrated with the membrane; measure the DPC projection from external wall in mm; check laps and seals between membrane and DPC - note any potential stress points and tension between the two; check for damage to DPC
14.	Service entries and seals	Check top hat seal arrangement in accordance with design/specification (laps and seals between top hat and floor membrane, pipe upstand is usually a minimum 150 mm) check. Take photographs for all plots inspected
15.	Cavity inspection	Check gas membrane or gas resistant DPC is taken across cavity. Check for rips across cavity. Check for jointing detail of gas resistant DPC or membrane across cavity to main membrane. Take photographs for all plots inspected

This confirms that PLOT 42 at Ilk Street and Alpine Street, Clayton has PASSED / ~~FAILED~~ inspection

(any proposed remedial works should be noted in the 'notes/recommendations' column of this form)

An additional inspection ~~IS~~ / IS NOT required for this plot

Qualified Engineer:DAVID EMMOTT..... Signed:.....
(print name)



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

ANNEX E

Validation Photographs



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

bEk Enviro Ltd

Suite One | No 3 Mitton Road Business Park
Mitton Road | Whalley | Lancashire | BB7 9YE

01254 377622

mbuckley@bekenviron.co.uk | bekenviron.co.uk



Photograph 1: Validation of Garden Capping Thickness



Photograph 2: Validation of Garden Capping Thickness



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

bEk Enviro Ltd

Suite One | No 3 Mitton Road Business Park
Mitton Road | Whalley | Lancashire | BB7 9YE

01254 377622

mbuckley@bekenviron.co.uk | bekenviron.co.uk



Photograph 3: Validation of Geotextile Membrane



Photograph 4: Validation of Sub-Floor Void Space (min 150 mm)



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

bEk Enviro Ltd

Suite One | No 3 Mitton Road Business Park
Mitton Road | Whalley | Lancashire | BB7 9YE

01254 377622

mbuckley@bekenviron.co.uk | bekenviron.co.uk



Photograph 5: Validation of Gas Membrane Installation



Photograph 6: Validation of Gas Membrane Installation



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

bEk Enviro Ltd

Suite One | No 3 Mitton Road Business Park
Mitton Road | Whalley | Lancashire | BB7 9YE

01254 377622

mbuckley@bekenenviro.co.uk | bekenenviro.co.uk



Photograph 7: Validation of Gas Membrane Installation



Photograph 8: Validation of Gas Membrane Installation