



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

GLENDENE, WYTHENSHAW

Remediation Method Statement



Prepared for:

Report Ref: BEK-22097-1 (Rev A)

November 2022





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

Project Quality Assurance Information Sheet

Site	Glendene, Wythenshawe
Report Title	Remediation Method Statement
Report Status	Final
Report No	BEK-22097-1 (Rev A)
Date	November 2022
Prepared For	THE CASEY GROUP Rydings Road Rochdale OL12 9PS
Prepared By	BEK ENVIRO LIMITED Suite One No 3 Mitton Road Business Park Mitton Road Whalley Lancashire BB7 9YE
Author	Alice Molyneux BSc MSc
Checked	David Emmott BSc (Hons) MSc MEnvSci CEnv
Authorised	Michael Buckley BSc (Hons) MSc MEnvSci CEnv
Contact	mbuckley@bekenviro.co.uk www.bekenviro.co.uk Office: 01254 377622 Mobile: 07906753583

GLENDENE, WYTHENSHAW

Remediation Method Statement

PROJECT NO: 22097

REPORT REF: BEK-22097-1 (Rev A)

DATE: November 2022

REVISION STATUS / HISTORY

Rev	Date	Issue / Comment	Prepared	Checked
A	Nov 2022	Further SI Works	JM	MB

GENERAL REPORT LIMITATIONS

BEK Enviro Limited (BEK) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and BEK. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by BEK for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of BEK and the party for whom it was prepared. Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

Unless explicitly agreed otherwise, in writing, this report has been prepared under BEK's limited standard Terms and Conditions as included within our proposal to the Client.

The report needs to be considered in the light of the BEK proposal and associated limitations of scope. The report needs to be read in full and isolated sections cannot be used without full reference to other elements of the report and any previous works referenced within the report.

TABLE OF CONTENTS

1.	INTRODUCTION
2.	PREVIOUS INVESTIGATION
2.1	Summary of Previous Site Investigation
2.2	BEK Comments
2.3	Further Site Investigation – BEK Enviro Ltd – October 2022
2.4	BEK - Additional Recommendations/Final Comment
3.	REMEDICATION STRATEGY
3.1	Contamination
3.2	Imported Material
3.3	Construction Workers
3.4	Unforeseen Circumstances
3.5	Utilities
3.6	Concrete Mix Design
3.7	Off-Site Disposal
3.8	Re-Use of Waste Soils on Site
3.9	Communication
3.10	Statutory Consultation
3.11	Pre-Start Meeting
3.12	Closure
4.	SUPERVISION & VALIDATION
4.1	Supervision of Works
4.2	Validation of Works
4.3	Imported Material
4.4	Assessment Criteria
4.5	Assessment of Chemical Test Results
5.	REPORTING

APPENDICES	
Appendix A	Chemical Test Results
Appendix B	Photographs
Appendix C	Drawings

TABLES	
Table 1	Summary of Contamination Assessment (BEK further site investigation)
Table 2	Summary of Asbestos Quantification Testing in Positive Samples
Table 3	Limits for Phytotoxic Contaminants (Units mg/kg)
Table 4	Test Schedule for Soils to be Used in Landscape/Garden areas
Table 5	Assessment Criteria for Imported Soils

DRAWINGS	
BTP Architects Drawing No 105: 'Site Plan Option 1'	

1. INTRODUCTION

- 1.1.1 BEK Enviro Limited (BEK) has been commissioned by The Casey Group Limited to prepare a method statement for the remediation works required at Glendene, Wythenshawe (hereafter referred to as 'the site').
- 1.1.2 The site has been subject to a 'Phase 1 Desk Study and Preliminary Geo-environmental Assessment' and a 'Phase 2 Geo-Environmental Investigation & Assessment' by WML Consulting (WML). BEK has also completed further site investigation to provide additional information with respect to the ground conditions/chemical nature of the soils within areas previously noted to be inaccessible (footprint of now demolished buildings) during the WML investigation. The recommendations set out by WML in the Phase 2 assessment and the findings of the BEK further site investigation provides the basis for this report.
- 1.1.3 It is understood that the site of a former children's care home is being considered for the demolition and the development of 56 low rise residential houses. External areas will comprise access roads, hardstanding for parking and private gardens.
- 1.1.4 A drawing showing the proposed site layout is presented in Appendix C (BTP Architects Drawing No 105: 'Site Plan Option 1', dated June 2018).
- 1.1.5 This report has been prepared to provide a summary of the remediation works required and the methodology for the validation of these works. The validation is important to confirm that the required works have been carried out in accordance with the approved remediation scheme and there are no future risks to end users of the site or the environment.

2. PREVIOUS INVESTIGATION

2.1 Summary of Previous Site Investigation

2.1.1 The potential risks from contamination have been quantified through site investigation carried out by WML. The works carried out, the assessment and the conclusions are presented in their 'Phase 2 Geo-Environmental Investigation & Assessment' dated January 2020 (Report Ref: 9003G-WML-00-XX RP-G-0002).

2.1.2 The WML Phase 2 report has formed the basis for the remediation works required at the site.

Scope of WML Investigation

2.1.3 WML drilled a total of 13 window sample boreholes to a maximum depth of 4 m and 2 machine excavated trial pits to a maximum depth of 1.8 m. Six gas/groundwater monitoring wells were installed at the site and samples were tested for a wide range of contaminants of concern in order to determine the risks from ground contamination. Furthermore ground testing was undertaken at regular intervals during the investigation and samples were submitted for geotechnical testing.

Summary of Ground Conditions

2.1.4 The site investigation has proved the presence of topsoil/made ground across the site to depths ranging between of 0.25 m and 1.5 m and comprised the following:

Topsoil - Within TP01, TP05, WS05, WS06 and WS13 topsoil was encountered to depths of between 0.4 m and 0.5 m. This comprised 'slightly silty, sandy clay with roots and rootlets'.

Made Ground - Made Ground was encountered in the majority of locations to depths ranging between 0.25 m and 1.5 m:

Within TP03, TP06, TP07, TP08, WS03, WS07, WS08, the made ground locally comprised a surface horizon of 'reworked topsoil' underlain by 'variably sandy and gravelly clay'. Gravel fragments included brick, limestone, concrete, sandstone and locally ash and clinker.

TP04, TP09 and WS04 encountered a surface horizon of made ground comprising 'slightly clayey, sandy gravel' overlying 'relict topsoil'.

Within TP11, TP12, WS10, WS11 and WS12, the made ground comprises variably 'clayey, gravelly sand and sandy gravel'. Gravel fragments included limestone, mudstone, brick, sandstone, concrete, wood and plastic.

TP02 and WS02 encountered made ground comprising locally 'gravelly, clayey sand'.

A surface horizon of asphalt encountered in TP10 and WS01 was underlain by variably 'sandy gravel including limestone and ash, clinker and brick'.

- 2.1.5 Within the majority of the exploratory holes, the topsoil or made ground was underlain by glacial till at depths of between 0.25 m and 1.5 m, extending to depths of between 0.9 m and 2.6 m. This generally comprised 'soft to firm, orange brown and locally grey mottled, slightly gravelly, sandy clay'. Within WS09 a horizon of 'very soft, dark brown, peaty clay' was recorded at 2.1 m to 2.5 m.
- 2.1.6 Bedrock in the form of 'Bollin Mudstone' was encountered within all of the window sample holes at depths of between 0.3 m and 2.5 m.
- 2.1.7 WML recorded no palpable visual/olfactory evidence of hydrocarbon contamination was encountered during the site investigation. Perched groundwater was encountered within WS08, WS09 and TP11 at depths of 2.0 m, 1.0 m and 0.7 m respectively, recorded as seepages within the weathered mudstone, glacial deposits and made ground respectively.

Summary of Contamination Assessment

- 2.1.8 The WML contamination assessment has confirmed that the site does not contain significant sources of ground contamination with the only exceedance relating to the PAH compound dibenzo(ah)anthracene being slightly elevated above assessment criteria.
- 2.1.9 Notwithstanding, 2 samples of made ground were found to contain fibres/clumps of chrysotile asbestos and other areas of asbestos within the made ground cannot be discounted.
- 2.1.10 WML concluded that pollution linkage is plausible in proposed garden areas where made ground is exposed at the surface and the following recommendations are provided:
- The long-term risk from exposure to contaminants will be mitigated by removing the made ground from garden areas or alternatively covering it with a 600 mm thickness of clean soil, comprising 450 mm of sub-soil and 150 mm of topsoil.
 - All groundworks should therefore be undertaken under a watching brief by an asbestos specialist with any ACM so encountered being segregated for removal to landfill. Such operations may also need to incorporate specific control measures such as dust suppression, perimeter air monitoring and appropriate Personal Protective Equipment (PPE), as determined by the specialist.

- 2.1.11 WML concluded that risks to controlled waters from the site are considered low with no environmental remediation is considered necessary.

Summary of Gas Risk Assessment

- 2.1.12 The six gas wells installed during the site investigation were monitored for ground gases and groundwater on a total of six occasions between 6 January 2020 and 1 June 2020.
- 2.1.13 Peak carbon dioxide concentrations range from 0.7 to 4.8 % with concentrations of 5 % recorded within WS7 and WS9 on the second monitoring visit only. Where 5 % was recorded the steady state concentrations also dropped to between 0.5 and 3.1%. The two peak carbon dioxide concentrations of 5 % are considered to be due to rising water levels. This traps the gas within the solid section of the standpipe, therefore in such cases the initial peak concentration may not be representative of the rate of gas generation.
- 2.1.14 No detectable positive steady state ground gas flows have been recorded during the monitoring visits. Peak flows were noted within WS4 (3 occasions) recorded at flows of between 0.1 and 0.6 l/hr and within WS9 and WS11, on the final visit only, with flows of between 0.4 and 2.0 l/hr. However, in all cases the steady flow rates were all below <0.1 l/hr.
- 2.1.15 Results for individual standpipes provide a maximum Q_{hg} value of <0.0047 l/hr which would classify the site as Characteristic Situation (CS) 1 - 'Very Low Risk' with no gas protection measures required.

2.2 BEK Comments

- 2.2.1 BEK has reviewed the WML report is well written and concise and the recommendations presented will mitigate the potential risks associated with contamination.
- 2.2.2 BEK also considers the ground gas risk assessment carried out by WML to be adequate and that no gas protection measures are required.
- 2.2.3 There are areas of the site that were inaccessible to WML (footprint of buildings) and BEK recommends that some additional investigation is carried out in these areas to confirm ground conditions are same/similar to elsewhere. This will pre-empt possible future issues.

Additional Site Investigation Proposals

- 2.2.4 Version 0 of this RMS noted that there were areas of the site that were inaccessible to WML (footprint of buildings) should be subjected additional site investigation to confirm ground conditions are same/similar to elsewhere.

2.2.5 This will pre-empt possible future issues. BEK recommends further site investigation comprising the following:

- Inspection and supervision of the excavation of trial pits in the locations of the previously inaccessible areas.
- Submission of further samples to be tested. Site investigation data will be assessed as part of a qualitative risk assessment and a letter report prepared detailing this work, the assessment, conclusions and recommendations.
- It may be necessary to amend this report to include conclusions and recommendations of the additional site investigation.

2.3 Further Site Investigation – BEK Enviro Ltd – October 2022

2.3.1 BEK attended site on 27th October 2022 to carry out further site investigation works to provide additional information pertaining to the ground conditions/chemical nature of the soils for the areas previously noted to be inaccessible (footprint of now demolished buildings) during the WML investigation.

2.3.2 The site investigation works comprised the excavation of 7no. trial pits excavated within the south/central areas of the site which were noted to be inaccessible during previous site investigation works.

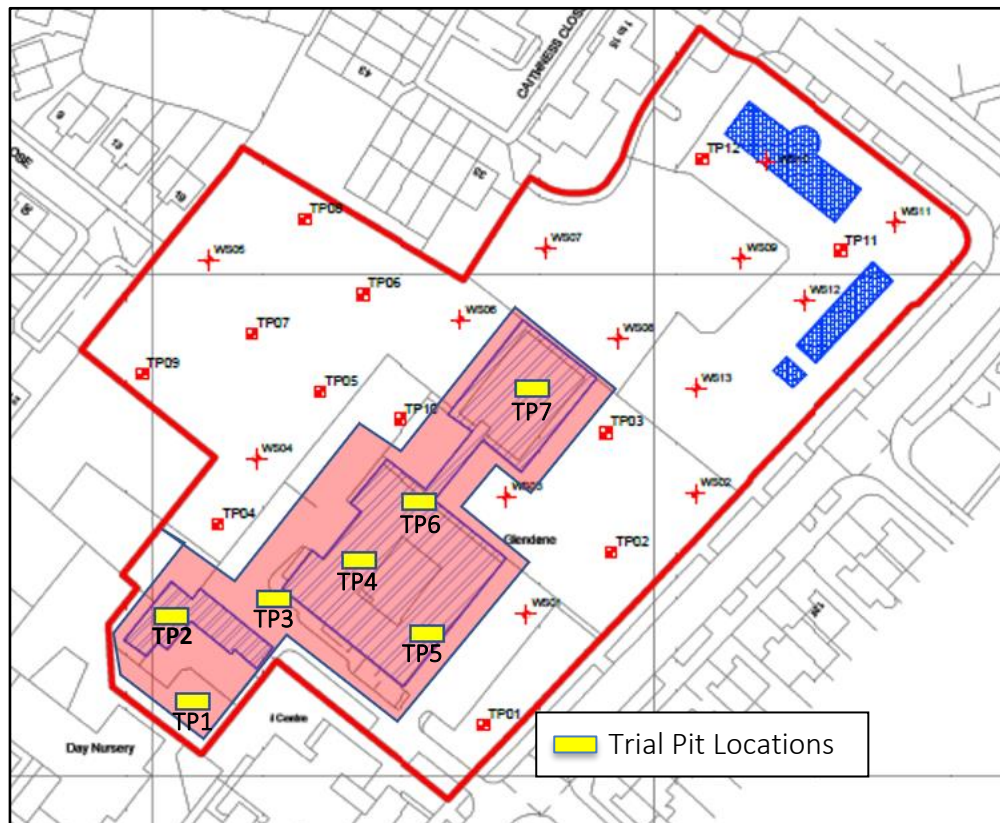


Figure 1: Additional Site Investigation Locations

Ground Conditions – Further Site Investigation

- 2.3.3 The ground conditions encountered during the further site investigation works are summarized below.

Trial Pit 1

Depth (m)	Soil Description
0 – 0.4	Firm orange/brown friable sandy clay with occasional coal fragments
0.4 – 0.6	Stiff orange brown occasionally grey mottled laminated sandy silty clay
Notes: D=0.2 m	

Trial Pit 2

Depth (m)	Soil Description
0.0 – 0.5	Red/grey fine to coarse sandy gravel of brick and concrete
0.5 – 1.0	Stiff orange brown occasionally grey mottled laminated sandy silty clay
Notes: D=1.0 m	

Trial Pit 3

Depth (m)	Soil Description
0 – 0.35	Red/grey fine to coarse sandy gravel of brick and concrete
0.35 – 0.5	Stiff orange brown occasionally grey mottled laminated sandy silty clay
Notes: D=0.2 m	

Trial Pit 4

Depth (m)	Soil Description
0 – 0.5	Grey/pink/black fine to coarse gravel with rare brick and rare rags
0.5 – 1.0	Stiff orange brown occasionally grey mottled laminated sandy silty clay
Notes: D=0.1 m	

Trial Pit 5

Depth (m)	Soil Description
0.0 – 0.5	Black/brown fine to coarse ashy sand with occasional fine to coarse gravel of clinker, brick and occasional clay pockets
0.5 – 0.8	Stiff orange brown occasionally grey mottled laminated sandy silty clay
Notes: D=0.3 m	

Trial Pit 6

Depth (m)	Soil Description
0 – 0.7	Grey/brown fine to coarse gravelly cobbly clay
0.7 – 1.2	Stiff orange brown occasionally grey mottled laminated sandy silty clay
Notes: D=0.5 m	

Trial Pit 7

Depth	Soil Description
0 – 0.1	Soft brown fine to coarse sandy clay with occasional fine to coarse gravel of brick and wire
0.1 – 0.4	Yellow fine to coarse gravel
0.4 – 0.6	Stiff orange brown occasionally grey mottled laminated sandy silty clay
Notes: D=0.05 m	

- 2.3.4 It is noted that the ground conditions encountered during the further site investigation works were generally consistent with those encountered during previous investigation carried out by WML.

Unexpected Basement/Tank

- 2.3.5 It is also noted that during the site visit to complete further site investigation works, a basement was being grubbed out under a subsection of the former now demolished children home building. BEK were informed that a tank had been encountered in the basement of the former children's home on site. Liaison with the demolition contractor on site suggested that the tank was full of heavy oil. BEK understand the oil was pumped from the tank whilst still in situ in the basement and removed from the site under the duty of care regulations.
- 2.3.6 The tank had been removed prior to BEK visit to site and placed in a segregated area in the south-west of the site. BEK made Caseys aware that the tank represented a new source of potential contamination which has not previously been mentioned within the Desktop/Phase 2 reports produced by WML Consulting.
- 2.3.7 Inspection of the tank by BEK in its segregated location indicated no spillages from the tank with the tank being in good condition. Photographic evidence of this has been collated by BEK. BEK instructed the client and the remediation contractor that the tank should also be removed from site under appropriate duty of care regulations.

- 2.3.8 BEK also inspected the area where the tank formerly stood and collated photographic evidence of the tanks former location (on concrete plinths). Again, no visual/olfactory evidence of contamination was present within area where the tank formerly stood.
- 2.3.9 Following breaking out of the basement BEK recommend that the area where the tank formerly stood be inspected to determine if visual/olfactory evidence of hydrocarbon contamination is present.
- 2.3.10 If no evidence of contamination is encountered, BEK recommended further photographic evidence is collated by Caseys and sent to BEK to confirm this.
- 2.3.11 If evidence of contamination was encountered BEK recommended works in the areas cease and BEK be contacted to carry out further assessment and supervise remediation of any hydrocarbon impacted areas.
- 2.3.12 In an email dated 2nd November 2022, BEK received confirmation from Caseys that following the full removal of the oil tank and foundation/slab. There were no visual signs of any contamination in the area. Photographic evidence was provided to demonstrate this.
- 2.3.13 A selection of photographs showing the excavated trial holes and the tank, former tank location are presented in Appendix B.

Chemical Testing

- 2.3.14 BEK submitted 4 samples of made ground to the UKAS accredited laboratory of Envirolab for chemical testing.

Human Health: Risk Assessment

- 2.3.15 The results have been compared to generic assessment criteria prepared for residential land use with plant uptake. These include the use of the Land Quality Management and Chartered Institute of Environmental Health assessment criteria (S4ULs) and Category 4 Screening Levels (C4SLs).
- 2.3.15 These assessment criteria have been derived using the CLEA model and fully justified input parameters. The contamination assessment has been undertaken using assessment criteria derived for a residential (with home grown produce) land use.
- 2.3.16 The following table summarises the chemical test results for the made ground tested and lists the relevant assessment criteria and the samples with a concentration in excess of the assessment criteria. Note that only determinands with a concentration above the laboratory limit of detection are presented in the table:

Determinands	Range of Concentrations (mg/kg)	Assessment Criteria (mg/kg)	Samples Fail
Arsenic	1 - 6.0	37 ¹	---
Boron (water soluble)	<1 - 1	290 ¹	---
Cadmium	<0.5 - 0.8	11 ¹	---
Copper	8.0 - 45.0	2400 ¹	---
Chromium	16 - 27.0	910 ¹	---
Lead	11.0 - 198	210 ²	---
Mercury	0.86 - 1.96	40 ¹	---
Nickel	10.0 - 27	180 ¹	---
Selenium	<1 - 4.0	250 ¹	---
Zinc	46.0 - 106	3700 ¹	---
Acenaphthene	<0.01 - 0.02	210 ¹	---
Acenaphthylene	<0.01 - 0.02	170 ¹	---
Anthracene	<0.02 - 0.04	2400 ¹	---
Benzo(a)anthracene	<0.04 - 0.2	7.2 ¹	---
Benzo(a)pyrene	<0.04 - 0.21	2.2 ¹	---
Benzo(b)fluoranthene	<0.05 - 0.23	2.6 ¹	---
Benzo(ghi)perylene	<0.05 - 0.12	320 ¹	---
Benzo(k)fluoranthene	<0.07 - 0.08	77 ¹	---
Chrysene	<0.06 - 0.24	15 ¹	---
Dibenzo(ah)anthracene	<0.04	0.24 ¹	---
Fluoranthene	<0.08 - 0.5	280 ¹	---
Fluorene	<0.01 - 0.02	170 ¹	---
Indeno(123-cd)pyrene	<0.03 - 0.13	27 ¹	---
Phenanthrene	<0.03 - 0.38	95 ¹	---
Pyrene	<0.07 - 0.44	620 ¹	---
Aliphatic Hydrocarbons >C12-C16	1	1100 ¹	---
Aliphatic Hydrocarbons >C16-C21	1.0 - 3.0	65000* ¹	---
Aliphatic Hydrocarbons >C21-C35	7.0 - 73	65000* ¹	---
Aromatic Hydrocarbons >C12-C16	<1 - 3	140 ¹	---
Aromatic Hydrocarbons >C16-C21	<1 - 8	260 ¹	---
Aromatic Hydrocarbons >C21-C35	<1 - 18	1100 ¹	---
Asbestos ID	1 of 4 samples	N.A.D	TP2 (0.3 m)

Table 1: Summary of Contamination Assessment (BEK further site investigation)

1 CIEH/LQM Derived Assessment Criteria (S4ULs based on 6% SOM)

2 Category 4 Screening Levels

- 2.3.17 It can be seen from the above table that there are no elevated concentrations above the assessment criteria.
- 2.3.18 Notwithstanding, one of the four samples tested proved positive for the presence of asbestos.
- 2.3.19 Copies of the chemical test results are presented in Appendix A.

Further Assessment - Asbestos

- 2.3.20 To further assess potential risks associated with asbestos identified in the sample recovered from Trial Pit No 2 (0.3 m), BEK instructed the laboratory to carry out further testing on the samples to quantify the asbestos present.

- 2.3.21 Table 2 below provides a summary of the type of asbestos identified in each sample and the quantification result.

Location/Depth	Asbestos Type/Matrix Description	Quantification Result (% w/w)
TP2 (0.3 m)	Amosite Board	<0.001

Table 2: Summary of Asbestos Quantification Testing in Positive Samples

- 2.3.22 Additional testing confirmed that the asbestos concentrations within the sample was below the laboratory limit of detection (<0.001%).
- 2.3.23 In accordance with HSG248 if asbestos [fibres] are identified at the limit of detection this is taken to be the equivalent of 'trace' asbestos for bulk materials.
- 2.3.24 Furthermore, the recent CIRIA publication 'Intepretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials' indicates that 'the potential risk from exposure to such trivial concentrations of asbestos in the external environment is likely to be very low to negligible.'
- 2.3.25 To further assess the potential issues with the asbestos present at the site, site specific information (ie type, concentration and end use) were input into the 'Joint Industry and Working Group' (JIWG) risk scoring algorithm for receptor ranking. Where parameters where unknown, the most conservative data was input into the algorithm.
- 2.3.26 From this assessment it can be seen that the combined hazard, receptor and exposure ranking for the asbestos in soils is low. Remedial measures will be required to mitigate the risks to the residential end user at the site.
- 2.3.27 In order to assign the appropriate work category to any future works with the asbestos containing soils at the site, BEK has input site specific information into the 'Joint Industry and Working Group' (JIWG) risk scoring algorithm for work categories. Again, where parameters were unknown, the most conservative data was input into the algorithm.
- 2.3.28 Based on the testing carried out work, with the soils at the site are not considered to fall under CAR-SOIL given that the concentration of asbestos encountered is at trace. Notwithstanding, this observation should be included within the site Asbestos Management Plan to be prepared for the site.
- 2.3.29 Moreover, the capping system suggested by WML will protect end users from the asbestos present on site.

Risk Assessment: Controlled Waters

- 2.3.30 The WML consulting report dismissed risks to controlled waters due to the absence of significant ground contamination (through visual/olfactory observations and chemical testing), the presence of glacial till limited migration of limited contamination, the distance of the closest surface water feature to the site (82 m north-east) and the limited resource value/utilization of the underlying aquifers.
- 2.3.31 Given the low contaminant profile was also observed during the BEK investigation, the risks to controlled waters remain low and no remediation is considered necessary.

Risk Assessment: Property

Risk to Concrete

- 2.3.32 The WML testing indicates that the design sulphate class for the majority of the site should be DS-1, AC-1.
- 2.3.33 To assess the potential risks to concrete below the former childrens home, BEK has compared the further site investigation data to assessment criteria presented in the BRE Special Digest 1: Concrete in Aggressive Ground.
- 2.3.34 The sulphate concentrations (water soluble 2:1) in the shallow ground range between 0.5 and 1.56 g/l. The pH range was 8.23 to 11.51.
- 2.3.35 With consideration to the range of pH values (8.23 to 11.51), the concrete classification suitable for the areas of the site formerly occupied by the on site children home buildings, would be DS-2 AC-2.

Risks to Services

- 2.3.36 Potable water supply pipes can be at risk from degradation if the shallow ground consists of specific organic contamination. Guidance published by UKWIR includes a methodology for the site investigation and risk assessment to determine pipe specification.
- 2.3.37 For brownfield sites, site investigation may be required along the intended route of the water pipeline and samples recovered from specific depths and tested for specific contaminants of concern.
- 2.3.38 On the basis of the ground conditions encountered, risks to water supply pipelines are considered to be negligible. However, it is recommended that consultation is undertaken with the water service supplier to confirm this.

Risks to Flora

- 2.3.39 Copper, nickel and zinc are toxic to plants. The effects of copper, nickel and zinc are often regarded as additive.
- 2.3.40 The assessment criteria used for copper, nickel and zinc, are 'pseudo total concentrations' are derived from BS3882:2007 as follows:

Phytotoxic Contaminant	pH Range		
	<6.0	6.0 to 7.0	>7.0
Zinc (nitric acid extractable)	<200	<200	<300
Copper (nitric acid extractable)	<100	<135	<200
Nickel (nitric acid extractable)	<60	<75	<110

Table 3: Limits for Phytotoxic Contaminants (Units mg/kg)

- 2.3.41 By comparing the chemical test results (Appendix A) to the concentrations in the above table, it can be seen that there are no elevated concentrations above the limit for phytotoxic contaminants.

2.4 BEK - Additional Recommendations/Final Comment

- 2.4.1 The further site investigation works carried out by BEK in areas of the site previously noted to be inaccessible (during the WML investigation) generally confirmed the ground conditions and the chemical nature of the soils to be relatively similar to those encountered during the WML investigation.
- 2.4.2 It was noted that an additional source of contamination (not previously accounted for during the WML contamination assessments) was encountered within the basement of the former children's home on site. However, accounts from the remediation contractor and on-site observations by BEK appear to indicate that the tank has been successfully decommissioned.
- 2.4.3 The further site investigation works confirms the WML conceptual model and confirms that the remedial recommendations (capping and asbestos management plan) provided by WML should remain in place for the site. However, BEK recommends the following additional actions should also be implemented:
- The positive asbestos concentration encountered within the BEK site investigation should be included within the Asbestos Management Plan for the site.
 - The plots located within the areas encompassing the former children's home should be constructed utilising typical sulphate design class and 'Aggressive Chemical Environment for Concrete' (ACEC) class DS-2, AC-2.

3. REMEDICATION STRATEGY

3.0.1 In order to remove potential risks to the development and/or human health specific remediation and mitigation measures need to be carried out.

3.0.2 Risks associated with the movement and placement of asbestos contaminated soils will be dealt with within an Asbestos Management Plan. If soils are to be removed from the site then they should be done so in accordance with the Duty of Care Regulations.

3.1 Contamination

3.1.1 The potential risks to human health are associated with the presence of asbestos.

3.1.2 To address the issues associated with the contamination identified the following works will need to be undertaken:

3.1.3 Risks associated with the asbestos contaminated soils should be dealt with within an Asbestos Management Plan (AMP). The AMP will provide a safe system of work to protect human health and satisfies the requirements of the Control of Asbestos Regulations 2012 and the items listed below:

- Taking reasonable steps to identify where asbestos is present
- Keep a written record of where asbestos has been identified
- Ensure that the risk of anyone being exposed to asbestos is assessed
- Ensure information is provided on the location and condition of asbestos-containing materials for anyone likely to disturb it
- Define who within an organisation is responsible for the above
- Ensuring the plan is reviewed if it is considered no longer valid

3.1.4 To mitigate the potential risks to human health associated with the asbestos impacted soils it is proposed to place the soils in a non-sensitive part of the site (at depth within residential gardens >600 mm, beneath a road or beneath the footprint of a property).

3.1.5 All soft landscaped/garden areas will be capped with a minimum of 600 mm of clean suitable soil (450 mm subsoil and 150 mm topsoil). The capping soils should be underlain by a 100 mm granular no-dig layer or a geotextile marker membrane to prevent mixing.

3.2 Imported Material

3.2.1 There may be a requirement to import suitable topsoil/subsoil for use in the landscape/garden areas of the development.

3.2.2 The suitability of the sub/topsoil and any other material imported to the site should be independently validated.

3.2.3 The details pertaining to the independent validation of material to be imported to the site are outlined within Section 4 of this report.

3.3 Construction Workers

3.3.1 It is recommended that construction personnel involved with direct contact with the soils at the site use appropriate PPE equipment (i.e. boots, gloves and overalls).

3.3.2 In addition, hygiene facilities should be made available in accordance with general health and safety guidelines. The successful remediation/site works contractor should undertake a suitable Risk Assessment to confirm the appropriate level of PPE.

3.3.3 A copy of all reports relating to the site should be included in the site Health & Safety File and site workers should be made fully aware of the sites setting.

3.4 Unforeseen Circumstances

3.4.1 Any areas of previously unidentified potentially contaminated soils encountered during site construction works must be brought to the attention of BEK, to ensure that the recommendations herein apply. Any potentially contaminated soils should be left in-situ and subjected to further assessment, to potentially include further chemical testing and risk assessment.

3.5 Utilities

3.5.1 Prior to redevelopment of the site, BEK would recommend that a copy of this report and the previous reports (prepared by WML) relating to the site are supplied to utility companies, and that their recommendations relating to appropriate supply pipes are adhered to.

3.5.2 A UKWIR Risk Assessment has been prepared by BEK for the site which recommends standard PE water pipes are suitable for the site.

3.6 Concrete Mix Design

3.6.1 WML recommends that as a minimum the design sulphate class for the majority of site should be designed for DS-1 conditions and ACEC class AC-1 (white shaded in Figure 2).

- 3.6.2 However, the plots located within the areas encompassing the former children's home should be constructed utilising typical sulphate design class and 'Aggressive Chemical Environment for Concrete' (ACEC) class DS-2, AC-2 (red shaded in Figure 4) .



Figure 2: Areas to use concrete class DS-1, AC-1 (white shaded) and DS-2 AC-2 (red shaded)

- 3.6.3 Confirmation that the correct concrete mix has been used on site is outside the BEK validation remit.

3.7 Off-Site Disposal

- 3.7.1 The chemical testing regime for off-site disposal may be different to the chemical testing required to assess the suitability of the soils for retention on site and the risks to human health. Therefore, additional assessment may be required to classify the soils for off-site disposal with testing criteria to assess whether the soil is hazardous, non-hazardous or inert waste. However, existing laboratory test certificates will help inform the process. Any additional testing (principally for asbestos) should also be used in the classification of the waste soils for off-site disposal.
- 3.7.2 The receiving landfill may require additional specialist laboratory testing to further characterise the material proposed for disposal against Waste Acceptance Criteria (WAC). We would recommend early consultation between the Contractor and the receiving landfill to determine any specific laboratory testing requirements.

- 3.7.3 Individuals/companies removing soils from the site are bound by a duty of care and as such this should only be undertaken by an authorised person. All waste movements should be accompanied by a waste transfer note.

3.8 Re-Use of Waste Soils on Site

- 3.8.1 The re-use of waste soils generated at the site should be covered through environmental permit exemptions (if applicable) and/or through the preparation of a Material Management Plan as part of compliance with the Definition of Waste: Code of Practice (DoW:CoP).

3.9 Communication

- 3.9.1 We would recommend that regular communication is maintained between BEK and the Site Manager throughout the development works.

3.10 Statutory Consultation

- 3.10.1 We would recommend that a copy of our Remediation Method Statement is issued to the local authority for review/comment and approval.
- 3.10.2 The NHBC may also require written approval of the remediation proposals from the regulators in order to satisfy their Land Quality Conditions.

3.11 Pre-Start Meeting

- 3.11.1 We would recommend that a meeting is held between the relevant parties on site, prior to commencement of validation works.

3.12 Closure

- 3.12.1 Following satisfactory completion of remediation works, BEK will produce a Validation Report to demonstrate compliance with this Remediation Method Statement.

4. SUPERVISION & VALIDATION

4.1 Supervision of Works

4.1.1 The works will be supervised by BEK who will ensure the following verification procedures are adopted:

- (i) Liaison with the appointed groundwork/remediation contractor
- (ii) Inspection and supervision of the works
- (iii) Collection of samples and co-ordination of laboratory testing

4.1.2 The local authority will be formally notified prior to commencement of the works and may attend site during the site remediation, as necessary.

4.1.3 The remediation areas will be checked and verified by the Engineer at key stages during the works, including:

- (i) Prior to and following placement of any imported material that is to be used in landscape/garden areas only.
- (ii) Recovery of validation samples, as required

4.2 Validation of Works

4.2.1 Validation testing is required to ensure the remediation works have been undertaken in accordance with the methodology presented herein.

4.2.2 It may not always be possible (or practicable) for BEK to be present for every stage of the remediation works and therefore some degree of verification will need to be undertaken by Casey or their appointed contractor. However, this should only be done following communication with BEK to ensure that appropriate validation records are maintained.

4.3 Imported Material

4.3.1 It may be necessary to import additional soil for use in the landscape/garden areas.

4.3.2 To confirm the suitability of the imported sub/topsoil used, it will be necessary to recover representative samples for chemical testing and assessment.

- 4.3.3 We initially recommend that this consists of a minimum of 3 samples, however the sampling frequency may be varied at the discretion of the Engineer depending on the nature and variability of the soil.
- 4.3.4 The methodology to validate the quality of any imported material for use in the landscaped areas will depend on the source of those materials. Materials from a known source, where independent risk assessment has been carried out would require no further testing, providing it has been sampled on an appropriate density and has been proven fit for purpose in accordance with residential criteria.
- 4.3.5 Without any validatory information, all potentially suitable backfill material will be thoroughly assessed at source prior to importation onto the site. The Engineer will obtain samples from the identified sources, at a rate of between 3 and 5 samples per source depending upon the volume of material available.
- 4.3.6 It will also be necessary to carry out routine inspection and sampling during the importation process in order to confirm the material is consistent with the source testing and assessment. The visual inspection shall ensure that the soil is visually suitable for use and does not contain any deleterious material (ie glass, plastic, brick, concrete etc).
- 4.3.7 Imported topsoil and subsoil being brought to the site should be tested for contamination to ensure that they are suitable for residential end use. Testing of imported soils can be undertaken upon import within a stockpile, or preferably upon placement within rear garden areas. Testing will vary based on the source of the material.
- 4.3.8 The sampling frequency may be varied at the discretion of the Engineer depending on the nature and variability of the imported material and its source.
- 4.3.9 Material to be used in the landscaped areas (including the formation level subsoil) should be (as a minimum) tested for the following to MCERTS standard:

Arsenic	Zinc
Cadmium	Cyanide
Chromium	Phenols
Copper	Sulphate
Lead	Speciated PAHs
Nickel	Total Organic Carbon
Mercury	Asbestos Screen

Table 4: Test Schedule for Soils to be Used in Landscape/Garden areas

- 4.3.10 Following assessment of the source of the material, it may be necessary to test for additional determinands.

4.3.11 The assessment criteria for the determinands to be tested for are presented in Table 5.

4.4 Assessment Criteria

4.4.1 Taking account the proposals to redevelop the site for a residential end-use it is necessary to adopt appropriate assessment criteria which protect end-users of the site. For a conservative assumption a Soil Organic Matter (SOM) of 1 % has been used.

Imported Soils

4.4.2 The following table provides a list of assessment criteria for assessing suitability of material to be used within the landscaped areas of the proposed development.

4.4.3 The criteria have been sourced from the LQM/CIEH Suitable 4 Use Level (S4UL). In addition, the category 4 Screening Level (C4SL) for lead has been used and the Atkins ATRISKSIL screening level for cyanide has been used.

Contaminant of Concern	Assessment Criteria (mg/kg)
Arsenic	37 ¹
Cadmium	11 ¹
Chromium (total)	910 ¹
Copper	2400 ¹
Lead	210 ²
Mercury	40 ¹
Nickel	180 ¹
Selenium	250 ¹
Zinc	3700 ¹
Cyanide	34 ³
Acenaphthene	210 ¹
Acenaphthylene	170 ¹
Anthracene	2400 ¹
Benzo(a)anthracene	7.2 ¹
Benzo(a)pyrene	2.2 ²
Benzo(b)fluoranthene	2.6 ¹
Benzo(ghi)perylene	320 ¹
Benzo(k)fluoranthene	77 ¹
Chrysene	15 ¹
Dibenzo(ah)anthracene	0.24 ¹
Fluoranthene	280 ¹
Fluorene	170 ¹
Indeno(1,2,3-cd)pyrene	27 ¹
Naphthalene	2.3 ¹
Phenanthrene	95 ¹
Pyrene	620 ¹
Asbestos	None detected

Table 5: Assessment Criteria for Imported Soils

1 CIEH/LQM Derived Assessment Criteria (S4UL) (1% SOM)

2 Category 4 Screening Level (C4SL)

3 Atkins ATRISKSIL screening level



GEO-ENVIRONMENTAL CONSULTING ENGINEERS

4.5 Assessment of Chemical Test Results

- 4.5.1 BEK will be responsible for the assessment of all chemical test results to determine suitability of material to be used on site.
- 4.5.2 The assessment will be undertaken in accordance with current UK policy and guidelines and any specific requirements of the local authority.
- 4.5.3 All chemical test results will be presented in the Validation Report.

5. REPORTING

- 5.1 On completion of the remediation and mitigation works, BEK will prepare a Validation Report.
- 5.2 The Validation Report will describe the works undertaken in order to satisfactorily demonstrate that the works have been completed successfully and will include the following:
- A description of works undertaken
 - Findings of the additional investigation works carried out
 - Record of any material imported into the site for use in the residential gardens (if required)
 - Validation samples recovered and tested
 - Assessment of the chemical test results
 - Photographs showing the remediation works being undertaken and completed

APPENDIX A

Chemical Test Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 22/10659
Issue Number: 1

Date: 08 November, 2022

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

Project Manager: Mick Buckley
Project Name: Glendene, Wythenshawe
Project Ref: Not specified
Order No: 7614-2211-J
Date Samples Received: 28/10/22
Date Instructions Received: 31/10/22
Date Analysis Completed: 08/11/22

Approved by:



Holly Neary-King
Client Services Supervisor

Envirolab Job Number: 22/10659

Client Project Name: Glendene, Wythenshawe

Client Project Ref: Not specified

Lab Sample ID	22/10659/1	22/10659/2	22/10659/3	22/10659/4				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP2	TP5	TP6	TP7						
Depth to Top	0.30	0.30	0.50	0.05						
Depth To Bottom										
Date Sampled	27-Oct-22	27-Oct-22	27-Oct-22	27-Oct-22						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	4AB	4AB	5A	4ABE						
% Stones >10mm _A	<0.1	40.6	14.5	6.4				% w/w	0.1	A-T-044
pH _D ^{M#}	11.51	8.76	8.74	8.23				pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	1.56	1.00	0.50	1.10				g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	22000	12000	980	3400				mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1				mg/kg	1	A-T-042sTCN
Phenols - Total by HPLC _A	<0.2	<0.2	<0.2	<0.2				mg/kg	0.2	A-T-050s
Organic Matter _D ^{M#}	2.2	11.0	0.6	3.5				% w/w	0.1	A-T-032 OM
Arsenic _D ^{M#}	1	4	4	6				mg/kg	1	A-T-024s
Boron (water soluble) _D	<1.0	<1.0	<1.0	1.0				mg/kg	1	A-T-027s
Cadmium _D ^{M#}	<0.5	<0.5	0.8	0.6				mg/kg	0.5	A-T-024s
Copper _D ^{M#}	8	45	21	34				mg/kg	1	A-T-024s
Chromium _D ^{M#}	16	17	27	27				mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<2	<1	<1				mg/kg	1	A-T-040s
Lead _D ^{M#}	11	198	33	57				mg/kg	1	A-T-024s
Mercury _D	1.96	0.95	0.86	0.91				mg/kg	0.17	A-T-024s
Nickel _D ^{M#}	10	26	27	23				mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	4				mg/kg	1	A-T-024s
Zinc _D ^{M#}	46	63	63	106				mg/kg	5	A-T-024s

Envirolab Job Number: 22/10659

Client Project Name: Glendene, Wythenshawe

Client Project Ref: Not specified

Lab Sample ID	22/10659/1	22/10659/2	22/10659/3	22/10659/4				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP2	TP5	TP6	TP7						
Depth to Top	0.30	0.30	0.50	0.05						
Depth To Bottom										
Date Sampled	27-Oct-22	27-Oct-22	27-Oct-22	27-Oct-22						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	4AB	4AB	5A	4ABE						
Asbestos in Soil (inc. matrix)^ @										
Asbestos in soil ^o	Amosite	NAD	NAD	NAD						A-T-045
Asbestos Matrix (visual) ^o	-	-	-	-						A-T-045
Asbestos Matrix (microscope) ^o	Board	-	-	-						A-T-045
Asbestos ACM - Suitable for Water Absorption Test? ^o	No	N/A	N/A	N/A						A-T-045
Asbestos in Soil Quantification % @ (Hand Picking&Weighing)										
Asbestos in soil % composition (hand picking and weighing) ^o	<0.001	-	-	-				% w/w	0.001	A-T-054

Envirolab Job Number: 22/10659

Client Project Name: Glendene, Wythenshawe

Client Project Ref: Not specified

Lab Sample ID	22/10659/1	22/10659/2	22/10659/3	22/10659/4				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP2	TP5	TP6	TP7						
Depth to Top	0.30	0.30	0.50	0.05						
Depth To Bottom										
Date Sampled	27-Oct-22	27-Oct-22	27-Oct-22	27-Oct-22						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	4AB	4AB	5A	4ABE						
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	0.02				mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	0.01	<0.01	<0.01	0.02				mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	0.04				mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04	0.20				mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	0.13	<0.04	<0.04	0.21				mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	0.11	<0.05	<0.05	0.23				mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	0.10	<0.05	<0.05	0.12				mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	0.08				mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	0.08	<0.06	<0.06	0.24				mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04				mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08	0.50				mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01	<0.01	<0.01	0.02				mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	0.10	<0.03	<0.03	0.13				mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03				mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	0.04	<0.03	<0.03	0.38				mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	0.09	<0.07	<0.07	0.44				mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	0.66	<0.08	<0.08	2.63				mg/kg	0.01	A-T-019s

Envirolab Job Number: 22/10659

Client Project Name: Glendene, Wythenshawe

Client Project Ref: Not specified

Lab Sample ID	22/10659/1	22/10659/2	22/10659/3	22/10659/4				Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	TP2	TP5	TP6	TP7						
Depth to Top	0.30	0.30	0.50	0.05						
Depth To Bottom										
Date Sampled	27-Oct-22	27-Oct-22	27-Oct-22	27-Oct-22						
Sample Type	Soil	Soil	Soil	Soil						
Sample Matrix Code	4AB	4AB	5A	4ABE						
TPH CWG with Clean Up										
Ali >C5-C6 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C6-C8 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1				mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1				mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	1	<1	1				mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	3	1	<1	2				mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	73	27	<1	7				mg/kg	1	A-T-055s
Total Aliphatics _A	77	30	<1	10				mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<3	<3	<3	<3				mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1	<1				mg/kg	1	A-T-055s
Aro >C12-C16 _A	2	3	<1	1				mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	8	2	<1	1				mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	18	7	<1	2				mg/kg	1	A-T-055s
Total Aromatics _A	28	12	<3	4				mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	105	41	<3	14				mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01				mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<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
 Subscript "A" indicates analysis has dependant options against results. Testing dependant on results appear in the comments area of your sample receipt.
 EPH CWG results have humics mathematically subtracted through instrument calculation
 TPH results "with Cleanup" indicates results cleaned up with Silica during extraction

EPH CWG GCxGC ID from TPH CWG

Where we have identified humic substances in any ID's from TPH CWG with Clean Up please note that the concentration of these humic substances is not included in the quantified results and are included in the ID for information.

Please contact us if you need any further information.

v2

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:	22/10659
Project:	Glendene, Wythenshawe	Date Received:	31/10/2022 (am)
Clients Project No:		Cool Box Temperatures (°C):	17.4

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	22/10659/1	22/10659/2	22/10659/3	22/10659/4
Client Sample No				
Client Sample ID/Depth	TP2 0.30m	TP5 0.30m	TP6 0.50m	TP7 0.05m
Date Sampled	27/10/22	27/10/22	27/10/22	27/10/22
A-T-019s	07/11/2022	07/11/2022	07/11/2022	07/11/2022
A-T-022s	03/11/2022	03/11/2022	03/11/2022	03/11/2022
A-T-024s	04/11/2022	04/11/2022	04/11/2022	04/11/2022
A-T-026s	04/11/2022	04/11/2022	04/11/2022	04/11/2022
A-T-027s	04/11/2022	04/11/2022	04/11/2022	04/11/2022
A-T-028s	07/11/2022	07/11/2022	07/11/2022	07/11/2022
A-T-031s	04/11/2022	04/11/2022	04/11/2022	04/11/2022
A-T-032 OM	04/11/2022	08/11/2022	08/11/2022	08/11/2022
A-T-040s	04/11/2022	04/11/2022	04/11/2022	04/11/2022
A-T-042sTCN	02/11/2022	02/11/2022	02/11/2022	02/11/2022
A-T-044	08/11/2022	08/11/2022	08/11/2022	08/11/2022
A-T-045	01/11/2022	01/11/2022	01/11/2022	01/11/2022
A-T-050s	03/11/2022	03/11/2022	03/11/2022	03/11/2022
A-T-054	02/11/2022			
A-T-055s	03/11/2022	03/11/2022	03/11/2022	03/11/2022
Calc-As Recd	03/11/2022	03/11/2022	03/11/2022	03/11/2022

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

APPENDIX B

Photographs

			
P1: TP1	P2: TP2		
			
P3: TP3	P4: TP4		
			
P5: TP5	P6: TP6		
Comments:			
This appendix is for illustrative purposes only and is for use only in conjunction with associated reports relating to the project	Photographs 1 to 6		
	Project No: 22097	Created By: J Mashiter	Date: November 2022
	Client: The Casey Group Limited		
Title: Appendix B - Site Photographs			



P7: TP7



P8: Area where tank formerly sat



P9: Area where tank formerly sat



P10: Tank appearing in good condition



P11: Area following the full removal of the oil tank and foundation/slab.



P12: Area following the full removal of the oil tank and foundation/slab.

Comments:



Photographs 7 to 12

This appendix is for illustrative purposes only and is for use only in conjunction with associated reports relating to the project

Site: Glendene, Wythenshawe

Title: Appendix B - Site Photographs

Project No: 22097

Created By:
J Mashiter

Date: November 2022

Client: The Casey Group Limited

APPENDIX C

Drawings

DO NOT SCALE FROM THIS DRAWING
ALL DIMENSIONS MUST BE CHECKED ON SITE BY CONTRACTOR PRIOR TO
CONSTRUCTION

SHARED OWNERSHIP

- 8 2B3P Houses
- 10 3B4P Houses
- 4 4B5P Houses

AFFORDABLE RENT

- 6 2B3P Bungalows
- 13 2B3P Houses
- 12 3B4P Houses
- 3 4B5P Houses

Rev	Date	Int	Description
6	14.01.19	AP	Road amended in line with received comments in order to increase rear garden size for plots 46,47,48,49
5	03.08.18	MA	Plot 12 garden amended.
4	10.07.18	FA	Changes to house areas
3	26.06.18	LT	Layout amended in line with comments received from WCHG 25.06
2	13.10.16	MA	Layout amended in line with received comments.
1	21.09.16	MA	Mk amended. Layout amended to suit.



RIBA #
Chartered Practice

Client: **WCHG**
Project: **Glendene**

Description:

Site Plan option 1

Purpose of Issue:

Feasibility

Drawn By:	Checked By:	Date:	Scale @ A2:
FA	VS	05/06/18	
Job No:	Status Code:	Drawing No:	Rev:
3375	S0	105	6

File Identifier:
GD-BTP-00-SP-DR-A-3375-105.6
Elisabeth House, 486 Oldbury Road, Hockley, Essex, S14 3BS
t 0161 483 2221 e info@bernardtaylor.co.uk w www.btparchitects.co.uk



00 Site Plan Option 1

1 : 500