

HANSON SPRINGS, ROCHDALE

Site Investigation & Ground Assessment





GEO-ENVIRONMENTAL CONSULTING

Project Quality Assurance Information Sheet

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Prepared For	B&E BOYS LTD Toddcarr Road Waterfoot Rossendale BB4 9SJ
Prepared By	BEK ENVIRO No 2 Landwick Court Metcalf Drive Altham Business Park Lancashire BB5 5GY
Author	Alice Bradley BSc (Hons)
Checked	David Emmott BSc (Hons) MSc MEnvSc CEnv
Authorised	Michael Buckley BSc (Hons) MSc MEnvSc CEnv
Contact	mbuckley@bekenviro.co.uk www.bekenviro.co.uk Office: 01254 377622 Mobile: 07906753583



GEO-ENVIRONMENTAL CONSULTING

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PROJECT NO: 25124

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REVISION STATUS / HISTORY

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1. INTRODUCTION

1.1 Appointment

- 1.1.1 BEK Enviro (BEK) has been commissioned by B&E Boys Ltd to carry out a site investigation and ground assessment for the land located at Hanson Springs, off Gorrells Way, Rochdale (hereafter referred to as 'the site'). The investigation will inform a quantitative risk assessment risk assessment with respect to contamination and ground gas at the site and provide recommendations for foundation design considering the proposed commercial development.

1.2 Proposed Development

- 1.2.1 This report has been prepared to support a planning application required to support a proposed extension to an existing building, as shown below (extension marked in yellow).

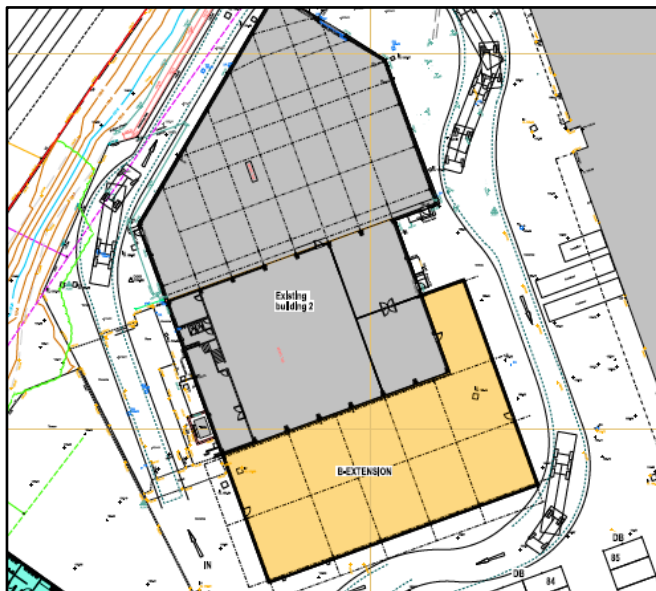


Figure 1: Proposed Site Plan

- 1.2.2 The Proposed New Build Plan is presented on Hawthorn Design Partnership Drawing No 188 PLN P 05 A, dated September 2024, a copy of which is presented in Appendix D.

1.3 Objective & Scope of Work

- 1.3.1 The site investigation was undertaken by BEK during August 2025 in accordance with the recommendations presented in the Preliminary Investigation Report (see below) to assess potential risks from contamination.
- 1.3.2 This report provides a summary of the site details and ground conditions encountered as well as a geotechnical assessment for foundation design.



1.4 Previous Reports

- 1.4.1 A Preliminary Investigation Report (PIR) has been prepared for the site by Ian Farmer Associates (Document No: 2231378-PIR-00-281024, dated October 2024). The PIR covers a larger area than the current site considered herein.
- 1.4.2 The PIR includes a review of available site information to produce a conceptual ground model and provides recommendations/proposals for the ground investigation (see Section 2).
- 1.4.3 The PIR should be read in conjunction with this report.

1.5 Limitations

- 1.5.1 The conclusions and recommendations presented in this report are the result of our professional interpretation of the information currently available. BEK reserve the right to amend the conclusions and recommendations if further information becomes available.
- 1.5.2 However, it should be noted that much of the information has been derived from reports written by others and BEK takes no responsibility for the accuracy of that information. Notwithstanding the above, the reports reviewed have all been written by professional environmental consultants with a duty of care to provide relevant and accurate information.
- 1.5.3 The comments given in this report and the opinions expressed are based on review of reports provided to BEK, ground conditions encountered during the site works and the results of tests made in the field and in the laboratory. However, there may be conditions pertaining to the site that have not been disclosed by the investigations and therefore could not be taken into account.
- 1.5.4 The presence of invasive plant species (ie Japanese Knotweed) is outside the remit of this assessment.



2. BACKGROUND INFORMATION

2.0.1 This section provides an overview of the findings and recommendations presented in the PIR. It is noted that the PIR covers a larger area than the current site considered herein.

2.1 Site Location, Layout and History

2.1.1 The site is situated off Gorrells Way, approximately 1.9 km to the south-west of the town centre of Rochdale. BGR SD 889 115.

2.1.2 The site was occupied by Hanson Springs, a manufacturing facility including a large manufacturing and administrative building, a smaller manufacturing building, material and waste storage areas and carparking areas.

2.1.3 Historically the site comprised agricultural land until circa 1977 where a large warehouse building in the east of site and a smaller building in the west. Circa 1988 the warehouse building is extended to the north-west (site's current layout).

2.2 Environmental Setting

Geology

2.2.1 The superficial deposits underlying the site comprise Glaciofluvial Deposits.

2.2.2 The bedrock beneath the site is comprises the Pennine Lower Coal Measures Formation.

Mining and Ground Stability

2.2.3 The site is located within a Coal Mining area, however, the PIR concludes the risk to the proposed development is very low. In addition, the site is unlikely to be affected by ground instability issues.

Hydrogeology and Hydrology

2.2.4 The superficial deposits and bedrock beneath the site are both classified by the EA as a Secondary A Aquifers.

2.2.5 Rochdale Canal is located immediately south-east of the site and Sudden Beck is located 43 m south-east of the site.



Contaminated Land & Landfill Activities

- 2.2.6 There have been six pollution incidents within 250 m of the site, the closest is located some 148 m south of the site, dated 1994, and was a significant incident related to diesel oil.
- 2.2.7 There is a BGS recorded landfill site located some 41 m north of the site.
- 2.2.8 There are two historical landfill sites within 250 m of the site, the closest is 40 m north.
- 2.2.9 A licenced waste site is located 384 m east of the site (Ashfield Valley Inert Landfill), with boundaries extending to 35 m north-east of the site.
- 2.2.10 There are five records of potentially infilled land within 250 m of the site, the closest is 83 m north.
- 2.2.11 There is 1 record of industrial land use for the site, referring to Hanson Springs Ltd. There are 23 records of industrial land uses within 250 m of the site.

Radon

- 2.2.12 The site is unlikely to be affected by radon gas as less than 1 to 3 % of surrounding properties are above the Radon Action Level. No radon protection measures are required.

2.3 Previous Investigations

- 2.3.1 A previous investigation was undertaken by Rogers Geotechnical Services Ltd in June and July 2017 (Report No. J3936/17/E).
- 2.3.2 The investigation consisted of two cable percussion boreholes to 15.45 mbgl, three WS boreholes drilled to between 4.0 and 5.0 mbgl, three dynamic probes advanced to between 8.7 and 10.7 mbgl and gas and groundwater monitoring on two occasions of standpipes installed in the cable percussion boreholes.
- 2.3.3 The exploratory holes were positioned around the proposed new building in the west of the site.
- 2.3.4 The ground conditions consisted of made ground to between 0.2 to 0.4 mbgl underlain by loose to medium dense gravelly sand to 8.4 and 9.6 mbgl and soft to stiff clayey silt / silty clay to 15.45 mbgl. Interbedded silty clay and silty sand was recorded between 10.50 and 15.45 mbgl in one cable percussion borehole. Strata was generally consistent across the investigation area.



2.3.5 A slight hydrocarbon odour was noted in one WS borehole between 1.85 and 2.0 mbgl.

2.3.6 No geo-environmental testing was undertaken as part of the investigation.

2.4 Conceptual Site Model

2.4.1 Based on background information, the following conceptual model is presented in the PIR:

Source	Contaminants of Concern	Potential Pathways	Receptor Group	Probability	Consequence	Risk
Made Ground	Asbestos Heavy Metals PAH TPH VOCs SVOCs Phenols Cyanide	Ingestion of contaminated soil by direct contact Entry of contaminants by skin or eye contact with contaminated soils or dust Inhalation of contaminated dust Inhalation or migration of toxic/explosive gases/vapours Direct contact	Humans			
			- Construction workers - Neighbouring site users	Unlikely Unlikely	Medium Medium	Low ¹ Low ²
			Water Environment			
			- Groundwater - Surface Water	Likely Likely	Medium Medium	Moderate Moderate
Ground Gases	Methane Carbon dioxide	Migration Ingression	Buildings, Materials and Services			
			Plastic pipes and services	Likely	Mild	Moderate/Low
			Humans and buildings			
			- Gas ingress into buildings - Site occupants	Low Likelihood Low Likelihood	Medium Medium	Moderate/Low Moderate/Low
¹ – Assumes that PPE is worn at all times						
² – Pathway exists only during the construction period						

Figure 1: Conceptual Site Model Taken from the PIR

2.5 PIR Recommendations

2.5.1 An intrusive investigation should be undertaken to address the geological hazards and / or potential pollutant linkages identified. The following scope of works is suggested in order to collect the required data:

- The sinking of boreholes for the recovery of samples for geotechnical and chemical contamination analysis. Exploratory locations should be located to target the areas of new development and undertaken to sufficient depth to facilitate pile design.
- The installation and monitoring of standpipes within the Made Ground and Glaciofluvial Deposits for ground gas and groundwater levels.
- The installation and monitoring of standpipes within the Made Ground and Glaciofluvial Deposits to monitor groundwater. Should sources of contamination be identified within the soil and leachate analysis, samples of groundwater should be obtained for chemical contamination analysis.



2.6 BEK Comments

- 2.6.1 BEK concurs with the recommendations set out in the PIR that site investigation works are required to support a geo-environmental assessment. For the purposes of the current commission, the site investigation should consider the proposed development specified herein.
- 2.6.4 The assessment of risks from ground gas should follow the standard presented in 'Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings' (BS8485:2015+A1:2019).
- 2.6.5 BEK also recommends Waste Classification and Waste Acceptance Criteria (WAC) testing is undertaken for removal of waste to landfill.
- 2.6.6 The previous site investigation information summarised in the PIR is for an area adjacent to the current site and ground conditions are expected to be similar.



3. SITE INVESTIGATION

3.1 General

- 3.1.1 This section provides a summary of the site investigation works undertaken by BEK in August 2025.
- 3.1.2 The site investigation has been designed to provide indicative information for the ground conditions across the site, to provide a quantitative assessment of potential risks associated with contamination and ground gas, and to provide recommendations with respect to foundation design and infiltration viability.
- 3.1.3 All exploratory locations were set out by the site engineer and the exploratory locations are illustrated on BEK Drawing No 25124-3, a copy of which is presented in Appendix D.

3.2 Window Sample Boreholes

- 3.2.1 Three window sample boreholes were drilled within the footprint of the proposed new unit using a window sample borehole rig to a maximum depth of 4.45 m. Gas/groundwater monitoring probes were installed in the boreholes (Boreholes WS1, WS3 and WS4).
- 3.2.2 In-situ testing (SPTs) were carried out in each of the boreholes.
- 3.2.3 Representative samples were recovered for chemical testing in accordance with the requirements set out in the PRA.
- 3.2.4 The ground conditions were recorded by an engineer from BEK and copies of the borehole records are presented in Appendix A.

3.3 Cable Percussive Boreholes

- 3.3.1 Three Cable Percussive Boreholes were drilled to the depth of 25.45 m in order to assess the deeper ground conditions at the site.
- 3.3.2 In-situ testing (SPTs) was carried out in the boreholes.
- 3.3.3 Representative samples were recovered for geotechnical testing.
- 3.3.4 The ground conditions were recorded by an engineer from BEK and a copy of the borehole records are presented in Appendix A.



3.4 Hand Excavated Foundation Pits

- 3.4.1 Three hand excavated foundation pits were undertaken adjacent to the current building on site to a maximum depth of 1.2 m for the purpose of assessing the existing foundations.
- 3.4.2 Representative samples were recovered for chemical testing in accordance with the requirements set out in the PIR.
- 3.4.3 The ground conditions were recorded by an engineer from BEK and the logs are presented in Appendix A.

3.5 Machine Excavated Trial Pits

- 3.5.1 Two machine excavated trial pits were carried out for the purpose of infiltration testing.
- 3.5.2 The pits were excavated to a depth of 1.5 m.
- 3.5.3 The ground conditions were recorded by an engineer from BEK and the logs are presented in Appendix A.

3.6 Laboratory Testing

Chemical Testing

- 3.6.1 Chemical laboratory testing was undertaken by the UKAS accredited laboratory of Envirolab. All testing was undertaken to MCERTS standard (where available). Samples were submitted for the following chemical analysis:
- Six soil samples and one water sample were tested for BEK's standard soil suite which includes: Arsenic, Cadmium, Copper, Lead, Nickel, Zinc, Chromium, Selenium, Mercury, Boron, Hexavalent Chromium, Cyanide, pH, 16 EPA Poly-Aromatic Hydrocarbons (PAH), Speciated Total Petroleum Hydrocarbons (TPH-CWG), Total Phenols and Sulphate
 - Six soil samples were tested Soil Organic Matter and Asbestos ID testing.
 - Two soil samples were tested for Waste Acceptance Criteria (WAC)
- 3.6.2 Copies of the chemical test results are presented in Appendix B.

3.7 Ground Conditions

- 3.7.1 The logs for all exploratory locations are presented in Appendix A and a summary of ground conditions is presented below:



Made Ground

- 3.7.2 Made ground was identified at the surface of each exploratory location to depths ranging between 0.5 m and 1.6 m. It is noted that Foundation Pit FP3 was terminated in the made ground at 1.2 m and the made ground may extend deeper than this. Types of made ground encountered are listed below:
- 3.7.3 Hardstanding was encountered at the surface of each exploratory location, with the exception of the Trial Pits.
- Tarmacadam was encountered at all the locations of hardstanding, with the exception of Foundation Pit FP1, to depths of 0.1 m or 0.2 m.
 - Concrete was encountered beneath the tarmacadam and at the surface of Foundation Pit FP1.
- 3.7.4 Made ground encountered beneath the concrete and at the surface of the trial pits and can generally be described as '*brown/grey sandy angular to subangular gravels*' the gravel principally of limestone, with lesser amounts of siltstone, sandstone, mudstone and concrete.

Natural Strata

- 3.7.5 Natural strata was encountered in all locations, with the exception of Foundation Pit FP3.
- 3.7.6 Sand was encountered underlying the made ground to the base the exploratory location in both trial pits (to 1.5 m), all boreholes (to 4.45 m) and in Foundation Pits FP1 and FP2 to 1 m and 1.2 m, respectively.
- 3.7.7 A summary of the natural ground encountered within the deeper cable boreholes is described below:
- Brown gravels of siltstone, sandstone, quartz and feldspar were encountered beneath the made ground in Borehole CP1 to 1.6 m, where silty clay is encountered to 12.8 m, over sand with clay bands to 22.0 m, where further clay is encountered to the base of the borehole (25.45 m).
 - Brown sandy clay is encountered beneath the made ground in Borehole CP2 to 2.7 m, over sand to 4.6 m, where further clay is encountered to the base of the borehole (25.45 m).
 - Orange brown gravelly sand is encountered beneath the made ground in Borehole CP3 to 1.2 m, over sand and gravel to 2.0 m, over sand to 6.0 m, where clay is encountered to 13.1 m, over sand to 17.9 m, over a thin layer



of clay to 18.5 m, over sand to 22 m, where further clay is encountered to the base of the borehole.

Groundwater

- 3.5.8 Groundwater was encountered in Borehole WS4 at 3.0 m and CP1 and CP3 at 13.0 m.

Visual/Olfactory Evidence of Contamination

- 3.5.9 There was no visual or olfactory evidence of contamination.

3.8 Environmental Monitoring

- 3.8.1 Gas and groundwater monitoring is ongoing and the results will be assessed within an addendum report that will be completed when the gas monitoring programme has been completed.

- 3.8.2 However, a summary of the monitoring undertaken to date (3 monitoring visits) is provided below:

Groundwater

- 3.8.3 Groundwater levels have been monitored in the boreholes are summarised in the following table:

Borehole Location	Recorded Water Level (m bgl)
WS1	Dry
WS3	Dry
WS4	2.58 - 2.73

Table 1: Summary of Water Levels in Boreholes

- 3.8.4 It can be seen from the above table that groundwater has been noted in Borehole WS4 on all occasions, with the other two locations remaining dry.
- 3.8.5 Note that seasonal variations in water levels cannot be accounted for over the short monitoring period.

Gas Monitoring

- 3.8.6 The boreholes have been monitored for ground gas on 3 occasions to date and a summary of the gas monitoring results are presented in the following table:

Location	Concentrations (% v/v)			Steady Flow Rate (l/hr)
	Carbon Dioxide	Methane	Oxygen	
WS1	0 - 0.2	0	20.3 - 20.5	0
WS3	0.6 - 1.1	0	18.6 - 20	0
WS4	0.1 - 0.6	0	18 - 20.5	0

Table 2: Summary of Gas Monitoring Data

3.8.7 The Gas Risk Assessment will be prepared as a separate report.

3.9 Infiltration Testing

Falling Head Tests

3.9.1 At the request of the client, BEK has carried out falling head tests in the two groundwater wells installed as part of the site investigation (Borehole WS1 and WS3). The work was required to support an indicative drainage design scheme. Details of the falling head tests can be seen in Appendix C.

3.9.2 The falling head test results are shown within Table 4 below and included in Appendix C.

Soakaway Testing

3.9.3 Following the results of the falling head tests, two trial pits for soakaway testing were excavated at the site to determine soil infiltration rates using the BRE 365 (2016) methodology to assess the viability of disposal of surface water from the site via infiltration.

3.9.4 Infiltration testing was undertaken at two locations in accordance with the requirements set out in BRE 365 (2016). The test locations are presented on BEK Drawing No 25028-3, a copy of which is presented in Appendix D.

3.9.5 BRE 365 states 'Fill the pit and allow it to drain three times to near empty; each time record the water level and time filling. Calculate the soil infiltration rate from the time taken for the water to fall from 75% to 25% effective storage depth in the pit, using the lowest f value of the three test results for design.'

3.9.6 The infiltration test trial pits were excavated using an excavator with the sides trimmed square. Water was discharged into the pits using a towed water bowser.

3.9.7 The test pit dimensions are as follows:

Test Pit No.	Length (m)	Width (m)	Depth (m)	Area (m ³)
TP01	1.5	0.6	1.5	1.35
TP02	1.5	0.6	1.5	1.35

Table 3: Infiltration test pit dimensions



- 3.9.8 The ground conditions in which infiltration tests were completed were generally described as 'light brown fine to medium sand' and 'Brown gravelly slightly silty medium to coarse sand.'
- 3.9.9 Water was discharged into the pit and the time taken for the water to infiltration into the soil was recorded. The results of the infiltration testing are included within Appendix C of this report and Table 4 below:

Infiltration Test Results

Trial Pit No.	Infiltration Test Number	Infiltration Rate (m/s)
TP01	1	8.18×10^{-5}
	2	7.12×10^{-5}
	3	4.36×10^{-5}
TP02	1	4.96×10^{-5}
	2	N/A
WS1	1	3.83×10^{-5}
WS3	1	3.84×10^{-5}

Table 4: Infiltration test pit dimensions

Conclusions

- 3.9.10 Falling head infiltration tests were completed within Boreholes WS1 and WS3. A further two infiltration trial pits were excavated at the site with infiltration testing undertaken in each pit. The results of the infiltration testing are shown within the table above and the infiltration test results are presented in Appendix C.



4. QUANTITATIVE RISK ASSESSMENT

4.1 Potentially Significant Pollutant Linkages

4.1.1 Potential pollutant linkages for the site are listed below:

- (i) Human Health - risks associated with contamination in the made ground and/or natural strata: via dermal contact, ingestion or inhalation for construction workers and neighbouring site users
- (i) Human Health - risks associated with indoor inhalation of ground gas for future site users
- (ii) Controlled Waters - risks associated with vertical and lateral movement of mobile contaminants into surface water and groundwater.
- (iii) Property - risks associated with contamination affecting concrete and service pipes. Risks to buildings are associated with ingress of gasses.

4.2 Risk Assessment: Human Health Risks from Exposure to Contaminated Soil

4.2.1 The risks to human health have been assessed by inspection of shallow soils for the presence of elevated contaminants based on the expected contaminant findings detailed in the conceptual model and completion of a quantitative risk assessment.

4.2.2 The soil contamination concentrations have initially been compared to a range of generic assessment criteria. These include the use of the Land Quality Management and Chartered Institute of Environmental Health assessment criteria (S4ULs), Category 4 Screening Levels (C4SLs) and the Contaminated Land: Applications in Real Environments assessment criteria (CL:AIRE).

4.2.3 These assessment criteria have been derived using the CLEA model and fully justified input parameters. The derivation of the assessment criteria assumes a commercial end use. The assessment assumes a soil organic matter (SOM) of 1 %.

4.2.4 The following table summarises the chemical test results for the samples 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 below:



Determinands	Range of Concentrations (mg/kg)	Assessment Criteria (mg/kg)	Samples Fail
Arsenic	<1 - 43	640 ¹	---
Cadmium	<1 - 1	190 ¹	---
Copper	4 - 12	68000	---
Chromium	3 - 21	8600 ¹	---
Lead	3 - 12	2300 ²	---
Nickel	4 - 27	980 ¹	---
Zinc	12 - 103	730000 ¹	---
Fluoranthene	<0.08 - 0.11	23000 ¹	---
Phenanthrene	<0.03 - 0.20	22000 ¹	---
Aliphatic Hydrocarbons >C12-C16	<1 - 5	59000 ¹	---
Aliphatic Hydrocarbons >C16-C21	<1 - 7	1600000 ¹	---
Aliphatic Hydrocarbons >C21-C35	<1 - 48	1600000 ¹	---
Aromatic Hydrocarbons >C8-C10	<1 - 42	26000 ¹	---
Aromatic Hydrocarbons >C12-C16	<1 - 4	35000 ¹	---
Aromatic Hydrocarbons >C16-C21	<1 - 4	28000 ¹	---
Aromatic Hydrocarbons >C21-C35	<1 - 17	28000 ¹	---
Asbestos ID	No asbestos detected		

Table 4: Summary of Contamination Assessment

¹ CIEH/LQM Derived Assessment Criteria

- 4.2.5 It can be seen from the above table that there are no elevated contaminants of concern, with the majority of concentrations measuring lower than the laboratory limit of detection.
- 4.3 Risk Assessment: Ground Gas**
- 4.3.1 Gas monitoring is on-going and a separate Ground Gas Risk Assessment will be prepared upon completion of the current gas monitoring programme.
- 4.4 Risk Assessment: Controlled Waters**
- 4.4.1 Potential risks to the quality of ground and surface water have been identified in the ground conceptual model. Risks are associated with contamination in the made ground and dissolution of contamination into perched water and vertical/lateral migration to groundwater and/or surface water receptors.
- 4.4.2 The profile of contamination encountered at the site is very low and below derived assessment criteria. BEK does not consider the made ground to represent a risk to controlled waters.



- 4.4.3 To further assess risks to controlled waters, one water sample from Borehole WS4 was recovered during the first monitoring visit.

Chemical Test Results & Assessment

- 4.4.4 As part of a Tier 1 assessment the concentrations professional judgement has been used to determine the most appropriate screening criteria.
- 4.4.5 Screening criteria have been selected from UK DWS Water Supply (Water Quality) Standards (DWS), UK Environmental Quality Standards (EQS) derived from the River Basin Typology, Standards and Groundwater threshold values (Water Framework Directive) (England and Wales) Directions 2015), USEPA standards and New Jersey Department of Environmental Protection Groundwater quality Criteria.
- 4.4.6 This is considered to be a conservative approach and consistent with the EA “GP3” Framework. Note that only determinands with a concentration above the laboratory limit of detection are presented in the table.

Determinand	Units	Concentration	Screening Criteria	Samples Fail
pH	pH	7.87	6.0 - 9.0	---
Ammoniacal Nitrogen as N	mg/l	0.06	0.5 ⁵	---
Chloride	mg/l	68	250 ²	---
Sulphate	mg/l	67	250 ¹	---
Dissolved Organic Carbon	mg/l	9.8	n.c	
Arsenic	µg/l	3	10 ¹	---
Boron	µg/l	138	1000 ¹	---
Pyrene	µg/l	0.01	0.025 ³	---
Aliphatic Hydrocarbons >C16-C21	µg/l	5	6000 ⁴	---
Aliphatic Hydrocarbons >C21-C35	µg/l	154	6000 ⁴	---
Aromatic Hydrocarbons >C8-C10	µg/l	10	100 ⁴	---
Aromatic Hydrocarbons >C10-C12	µg/l	6	100 ⁴	---
Aromatic Hydrocarbons >C12-C16	µg/l	12	100 ⁴	---
Aromatic Hydrocarbons >C16-C21	µg/l	15	90 ⁴	---
Aromatic Hydrocarbons >C21-C35	µg/l	18	90 ⁴	---

Table 5: Summary of Leachable Concentrations Assessment

- 1 DWS - UK DWS Water Supply (Water Quality) Regs (England & Wales 2000 SI 3184 & 2010 SI 994, Scotland 2001 SI 207, Northern Ireland 2007 No. 147)
- 2 EQS¹ - UK EQS Water Framework Directive (Standards and Classification Directions (England and Wales) 2015)
- 3 USEPA - USEPA Region 3 Freshwater Screening Benchmarks (7/2006)
- 4 WHO DWS - World Health Organisation Drinking Water Standard - 5 RPV - Scottish Resource Protection Value
- 5 RPV –Scottish Resource Protection Value n.c No criteria

4.4.7 It can be seen from the above table that there are no elevated contaminants of concern, with the majority of concentrations measuring lower than the laboratory limit of detection. It is noted that there is no available assessment criteria for Dissolved Organic Carbon, where the concentration has been reported above the limit of detection, however based on the overall contamination profile of the water and soil samples, BEK considers this to not represent a risk.

4.4.8 Risks to groundwater are therefore considered to be negligible.

4.5 Risk Assessment: Buildings

4.5.1 Risks to buildings include the assessment of the aggressive nature of the shallow ground with respect to concrete, the risks to the degradation of water pipes and flora due to contamination.

Risk to Concrete

4.4.2 To assess the potential risks to concrete, BEK has compared the site investigation data to assessment criteria presented in the BRE Special Digest 1: Concrete in Aggressive Ground.

4.4.3 Four sulphate concentrations (water soluble 2:1) in the shallow ground are below the BRE 2:1 water/soil extract concentration of 500 mg/l for Class DS-1 concrete, however two locations (WS4 0.4 m and WS4 0.5 m) exceed with value of 600 mg/l, therefore the Class would be DS-2.

4.4.4 With consideration to the range of pH values (8.48 to 11.61) the ACEC class recommended for the site is AC-2.

4.4.5 Therefore, the concrete classification suitable for the site would be DS-2 AC-2.

Risks to Services

4.5.6 Potable water supply pipes can be at risk from degradation if the shallow ground contains specific organic contamination. Guidance published by UKWIR includes a methodology for the site investigation and risk assessment to determine pipe specification.

4.5.7 On the basis of the ground conditions encountered, risks to water supply pipelines are considered to be low to moderate and it is recommended that consultation is undertaken with the water service supplier.



4.6 Risk Assessment: Conclusions

- 4.5.1 Made ground was identified at the surface of each exploratory location to depths ranging between 0.5 m and 1.6 m. Where superficial strata was encountered it generally comprised sand/clay with occasional gravels.
- 4.5.2 Samples recovered from site investigation have been tested for a wide range of contaminants in accordance with the recommendations outlined within the PRA and based on the observations made during the site investigation. The chemical test results have been compared to commercial assessment criteria assessment criteria to identify potential contaminants of concern.
- 4.5.3 Based on the contamination assessment herein, no risks have been identified with respect to contamination at the site.
- 4.6.4 Gas monitoring is on-going and a separate Ground Gas Risk Assessment will be prepared upon completion of the current gas monitoring programme
- 4.5.5 Risks to controlled waters are considered to be negligible.
- 4.5.6 Potential risk to water pipes are considered to be very low, however advice should be sought from the water supply provider.
- 4.5.7 Risks to concrete are considered to be medium to low and concrete classification of DS-2 AC-2 will be suitable.

5. GEOTECHNICAL ASSESSMENT

- 5.1 It is understood that the proposed development consists of the extension to an existing large industrial unit. It is presumed that the extension structure will be formed using a steel frame, supporting lightweight cladding to walls and roof. It is also presumed that the ground floor slab will be formed in concrete. There are two small office units located in one corner of the extension - it is presumed that these will be of lightweight construction and of single storey height. The guidance given herein will therefore need to be reviewed in terms of the actual building type to be adopted, by a suitably qualified and experienced engineer.
- 5.2 Site investigation has encountered made ground at each location varying in thickness from 0.5 m to 0.8 m. Underlying the made ground is medium dense sand with occasional clay pockets, which extends to the bases of boreholes. The cable percussive boreholes indicate varied ground conditions. Borehole CP1 encountered gravels under the made ground. At 1.8 m soft clays were encountered that extended to a depth of 12.8 m where sands are found, at 22.0 m stiff clays are encountered that extend to the base of the borehole. In Borehole CP2 encountered a band of clay between 1.6 m depth and 2.7 m, then sand to 4.6 m before clay is again encountered to 17.2 m, then another band of sand to a depth of 21.6 m before clay is again found at the base of the hole. In Borehole CP3 there are varying sand layers between 0.8 m depth and 6.0 m depth, where soft clays are encountered to a depth of 13.0 m, a layer of gravel is then found that extends to a layer of sand at 15.2 m down to 17.9 m, then clay to 18.5 m, then sand to 22.0 m, before clay is found at the base of the hole.
- 5.3 The trial pit logs show made ground, of varying depths between 0.7 m and 0.8 m. The made ground is formed from sub-angular limestone gravels. Below the gravel at both locations is a fine to medium coarse sand.
- 5.3 Groundwater was encountered at a depth of 13.0 m in the sands within Borehole CP1, and at a depth of 13.2 m in the gravel layer in Borehole CP3. Bedrock is not believed to be encountered during the investigation works.
- 5.4 Samples for clay plastic testing were not required for the site investigation, as non-cohesive soils have been found at shallow depths.
- 5.5 Standard Penetration Tests (SPT) were conducted in the WS boreholes, starting at a depth of 1.0 m and repeated at 1.0 m levels from 2.0 m onwards. The SPT results are summarised in Table 6 below:

Depth of Test (m)	Depth of Test (m)					
	WS1	WS3	WS4	CP1	CP2	CP3
1 - 1.45	20	18	20	20	13	15
2 - 2.45	23	21	23	9	4	24
3 - 3.45	24	23	24	10	3	32
4 - 4.45	34	27	34	8	8	
5 - 5.45				17	10	
6 - 6.45				14	11	16
7 - 7.45				13	13	13
8 - 8.45				11	15	11
9 - 9.45				11	14	10
10 - 10.45				10	8	10
11 - 11.45					9	
12 - 12.45				10	11	11
13.5 - 13.95				6	10	6
15 - 15.45				5	11	5
16.5 - 16.95				7	10	6
18 - 18.45				7	9	10
19.5 - 19.95				10	12	8
21 - 21.45				7	22	10
22.5 - 22.95				42	22	50
24 - 24.45				42	27	40
25 - 25.45				40		37

Table 6: Borehole SPT Results

Assessment & Conclusions

- 5.6 The WS boreholes indicate the soils at formation depths are medium dense sands, with occasional lens of clays. The SPT results on the sands indicate that bearing capacities of at least 150 kN/m² are present within the soils. The cable percussive boreholes indicate bearing capacities at 1.0 m of over 100 kN/m² are present. These results drop to under 50 kN/m² at 2.0 m depth and 35 kN/m² at 3.0 m, in Borehole CP2. Results in Boreholes CP1 and CP3 are still in excess of 100 kN/m² at 2.0 m and 3.0 m. This suggests that there may be a localised soft spot at Borehole CP2. This will need to be considered by the foundation designer.
- 5.7 The proposed new structure is to be formed from a steel framed structure, with a two storey office accommodation to one side. Depending on frame spacings, the column bases to the workshop could be of magnitude 100 kN to 150 kN, with those to the office being 300 kN to 350 kN. Furthermore, the slab to the workshop area will receive heavy loading, probably in excess of 20 kN/m² (to be confirmed). Adopting shallow foundations will therefore not be suitable. The building should be formed on rotary cored piles (to overcome the concrete slab issue) and have a heavy raft to form the slab to the workshop, with downstand beams to support perimeter walling and posts.



- 5.8 The proposed extension to the building is to be formed from a steel frame with lightweight cladding. Dependent upon frame spans and spacings, column loads of between 150 kN and 200 kN can be expected. Based upon these loads, the adoption of simple pad bases and strip footings could be adopted, based on bearing capacities of 100 kN/m². The designer will need to be mindful, however, of the potential soft spot around Borehole CP2. Some localised compaction of the underlying soils using dynamic compaction, locally, may need to be considered.
- 5.9 All formations must be checked on site to confirm that the design bearing capacity is extent before foundations are installed. Should areas of poor ground be encountered, the excavations may require extending until suitable strata is found, and the design engineer's instruction must be sought.
- 5.10 With the underlying natural soils being of sands, the adoption of a ground bearing slab can be considered. The bearing capacities at the head of the sand has been found to be in excess of 100 kN/m², which will be suitable for the likely loads. All fill materials, however, will require removal and the ground brought back to the required level using engineered sub-base materials, suitably compacted in layers.
- 5.11 Local trees may have a bearing on the proposed building foundations, which will need to be appraised by the foundation designer. Formation levels must be designed to comply with LABC requirements and NHBC Ch.4.2 guidance.
- 5.12 All foundation designs must be reviewed and designed by a suitably qualified design engineer. The above advice is based upon the ground condition information obtained during the survey. The design engineer must satisfy themselves that the information meets with their design requirements.

6. RECOMMENDATIONS

- 6.1 This report provides an assessment of the ground conditions based on the assessment of available site investigation information. The assessment quantifies the potential risks associated with contamination and provides recommendations for foundation design considering the development proposals.

Contamination Assessment

- 6.2 Based on the contamination assessment herein and with respect to the redevelopment of the site for industrial use, no potential risks to human health, controlled waters or flora have been identified.
- 6.3 BEK recommends the following
- (i) All ground workers adopt suitable PPE when working on the site and consider the requirements of site-specific risk assessments and working method statements.
 - (ii) All groundworkers should remain vigilant during ground excavations for the presence (or suspected presence) of contamination. Should suspected contamination be identified then work should cease and specialist advice sought.
 - (iii) Any material removed from the site should be disposed of in accordance with appropriate in accordance with appropriate legislation and regulations, including the Duty of Care Regulations. Natural material to be removed from site is likely to be classified as inert for disposal purposes.
- 6.4 Risks to concrete are considered to be medium to low and a classification of DS-2 AC-2 is considered to be suitable for the site.
- 6.5 Gas monitoring is on-going and a separate Ground Gas Risk Assessment will be prepared upon completion of the current gas monitoring programme.

Geotechnical Assessment

- 6.6 The window sample boreholes indicate the soils at formation depths are medium dense sands, with occasional lens of clays. The SPT results on the sands indicate that bearing capacities of at least 150 kN/m² are present within the soils. The cable and percussive boreholes indicate bearing capacities at 1.0 m of over 100 kN/m² are present. These results drop to under 50 kN/m² at 2.0 m depth and 35 kN/m² at 3.0 m, in Borehole CP2. Results in Boreholes CP1 and CP3 are still in excess of 100 kN/m² at 2.0 m and 3.0 m. This suggests that there may be a localised soft spot at Borehole CP2. This will need to be considered by the foundation designer.



- 6.7 The proposed new structure is to be formed from a steel framed structure, with a two storey office accommodation to one side. Depending on frame spacings, the column bases to the workshop could be of magnitude 100 kN to 150 kN, with those to the office being 300 kN to 350 kN. Furthermore, the slab to the workshop area will receive heavy loading, probably in excess of 20 kN/m² (to be confirmed). Adopting shallow foundations will therefore not be suitable. The building should be formed on rotary cored piles (to overcome the concrete slab issue) and have a heavy raft to form the slab to the workshop, with downstand beams to support perimeter walling and posts.
- 6.8 The proposed extension to the building is to be formed from a steel frame with lightweight cladding. Dependent upon frame spans and spacings, column loads of between 150 kN and 200 kN can be expected. Based upon these loads, the adoption of simple pad bases and strip footings could be adopted, based on bearing capacities of 100 kN/m². The designer will need to be mindful, however, of the potential soft spot around Borehole CP2. Some localised compaction of the underlying soils using dynamic compaction, locally, may need to be considered.
- 6.9 All formations must be checked on site to confirm that the design bearing capacity is extent before foundations are installed. Should areas of poor ground be encountered, the excavations may require extending until suitable strata is found, and the design engineer's instruction must be sought.
- 6.10 With the underlying natural soils being of sands, the adoption of a ground bearing slab can be considered. The bearing capacities at the head of the sand has been found to be in excess of 100 kN/m², which will be suitable for the likely loads. All fill materials, however, will require removal and the ground brought back to the required level using engineered sub-base materials, suitably compacted in layers.
- 6.11 Local trees may have a bearing on the proposed building foundations, which will need to be appraised by the foundation designer. Formation levels must be designed to comply with LABC requirements and NHBC Ch.4.2 guidance.
- 6.12 All foundation designs must be reviewed and designed by a suitably qualified design engineer. The above advice is based upon the ground condition information obtained during the survey. The design engineer must satisfy themselves that the information meets with their design requirements.

Waste Soil Management

- 6.13 Careful management of soils during the excavation works will ensure optimum utilisation of soil resources.
- 6.14 Excavated soils which require off-site disposal are anticipated to be classified in accordance with the following document: Guidance on the Disposal of "Contaminated Soils" Version 3 (April 2001); produced by the Environment Agency.



- 6.15 On the basis it is considered likely that soils from the majority of the site would classify as “Non-hazardous”/”Inert” for disposal; however this is subject to confirmation of the potential landfill use. In all cases where excess soils require off-site disposal, the materials needs to be managed under the appropriate legislation and consideration given to any remedial techniques that could be used to improve the soil.
- 6.16 If waste soils are to be re-used on site then a suitable permit exemption should be put in place (if appropriate) or a Material Management Plan should be prepared as part of compliance with the CL:AIRE Definition of Waste:Code of Practice.

Water Pipe Specification

- 6.17 Consideration should be given to the requirements of the water supply provider. They are likely to require the UKWIR risk assessment to be completed to determine the specification for the water pipes. It is recommended that the water supply provider is contacted and enquiries made.

APPENDIX A

Exploratory Logs



BOREHOLE LOG CP1 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 7/8/25 - 8/8/25	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER Lundy Site Investigation	ELEVATION
CLIENT B&E Boys Ltd	DIA - CP 150mm - 25.00m	
DRILLING METHOD Cable Percussion		LOGGED BY PC
LOCATION CP1	DEPTH 25.45m	CHECKED BY MB

Remarks 1. Location cleared of services prior using a CAT & Genny. 2. Water added from 11.80m **Casing - CP** 150mm - 25.00m

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
0.5	D- 0.40 m				TARMACADAM	0.5		
	D- 0.70 m				CONCRETE.			
1					MADE GROUND: Brown slightly sandy clayey angular to subangular fine to coarse gravel of limestone.	1		
1.5		20	2,3/5,5,4,6		Brown mottled grey and yellow very sandy subangular to rounded fine to coarse GRAVEL of siltstone, sandstone, quartz and feldspar.	1.5		
2	D- 1.80 m	9	1,2/2,2,2,3		Soft reddish brown slightly sandy silty CLAY with occasional fine to coarse sand bands.	2		
2.5						2.5		
3		10	1,2/2,3,2,3			3		
3.5						3.5		
4		8	2,2/2,2,2,2			4		
4.5						4.5		
5	D- 5.00 m	17	1,3/3,4,5,5		Soft to firm brown silty CLAY.	5		
5.5						5.5		
6		14	1,3/4,3,3,4			6		
6.5						6.5		
7		13	1,2/3,3,3,4			7		
7.5						7.5		
8		11	1,2/2,2,3,4			8		
8.5						8.5		
9		11	1,2/2,3,3,3			9		
9.5						9.5		
10						10		



BOREHOLE LOG CP1 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
10	D- 12.80 m	10	1,2/2,3,2,3		Brown silty slightly clayey fine to coarse SAND with clay bands.	10		
10.5						10.5		
11						11		
11.5						11.5		
12		10	1,2/2,2,3,3			12		
12.5						12.5		
13						13		
13.5		6	1,1/2,1,1,2			13.5		
14						14		
14.5						14.5		
15		5	1,1/1,1,1,2			15		
15.5						15.5		
16						16		
16.5		7	1,1/2,2,1,2			16.5		
17						17		
17.5						17.5		
18		7	1,1/2,2,1,2			18		
18.5						18.5		
19						19		
19.5		10	1,2/2,3,3,2			19.5		
20						20		
20.5						20.5		
21		7	1,2/2,1,2,2			21		
21.5						21.5		



BOREHOLE LOG CP1 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
22	D- 22.00 m		2,5/8,10,11,13		Stiff brown slightly sandy slightly gravelly CLAY. Gravel is subangular to subrounded fine to medium of siltstone and sandstone.	22		
22.5		42				22.5		
23						23		
23.5	D- 23.50 m					23.5		
24		42	5,6/8,12,10,12		Firm to stiff greyish brown slightly sandy laminated CLAY.	24		
24.5						24.5		
25		40	6,8/8,10,11,11			25		
25.5					Terminated at 25.45m.	25.5		
26						26		
26.5						26.5		
27						27		
27.5						27.5		
28						28		
28.5						28.5		
29						29		
29.5						29.5		
30						30		
30.5						30.5		
31						31		
31.5						31.5		
32						32		
32.5						32.5		
33						33		
33.5						33.5		



BOREHOLE LOG CP2 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 6/8/25 - 7/8/25	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER Lundy Site Investigation	ELEVATION
CLIENT B&E Boys Ltd	DIA - CP 150mm - 25.00m	
DRILLING METHOD Cable Percussion		LOGGED BY PC
LOCATION CP2	DEPTH 25.45m	CHECKED BY MB

Remarks 1. Location cleared of services prior using a CAT & Genny. 2. Water added from 1.20m **Casing - CP** 150mm - 25.00m

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
0.5					TARMACADAM	0.5		
					CONCRETE with rebar.			
1	D- 1.20-1.65 m	13	2,3/2,3,4,4		MADE GROUND: Brown gravelly slightly silty clayey fine to coarse sand. Gravel is subangular to subrounded fine to coarse of sandstone and limestone.	1		
1.5	D- 1.70 m					1.5		
2	D- 2.0-2.45 m	4	1,1/1,1,1,1		Soft to firm brown sandy CLAY.	2		
2.5	D- 2.70 m					2.5		
3	D- 3.0-3.45 m	3	1,2/1,1,1,-		Brown occasionally mottled black silty clayey fine to coarse SAND.	3		
3.5						3.5		
4	D- 4.0-4.45 m	8	1,2/2,2,2,2			4		
4.5	D- 4.60 m				Firm dark brown slightly sandy laminated CLAY with lenses of fine to coarse sand.	4.5		
5	D- 5.0-5.45 m	10	1,2/3,2,2,3			5		
5.5						5.5		
6	D- 6.0-6.45 m	11	1,2/2,3,3,3			6		
6.5						6.5		
7	D- 7.0-7.45 m	13	2,2/3,3,3,4			7		
7.5						7.5		
8	D- 8.0-8.45 m	15	3,3/3,4,4,4			8		
8.5						8.5		
9	D- 9.0-9.45 m	14	2,2/3,3,3,5			9		
9.5						9.5		
10						10		



BOREHOLE LOG CP2 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
10	D- 10.0-10.45 m	8	2,2/2,2,2,2		Below 10.10m, silty.	10		
10.5						10.5		
11	D- 11.0-11.45 m	9	1,2/2,2,3,2			11		
11.5						11.5		
12	D- 12.0-12.45 m	11	2,2/3,3,2,3			12		
12.5						12.5		
13						13		
13.5	D- 13.5-13.95 m	10	1,2/3,3,4,4			13.5		
14						14		
14.5	D- 14.40 m					14.5		
15	D- 15.0-15.45 m	11	2,2/2,3,3,3		Loose to medium dense brown silty fine to medium and with clay bands.	15		
15.5						15.5		
16						16		
16.5	D- 16.5-16.95 m	10	1,1/2,3,2,3			16.5		
17						17		
17.5	D- 17.20 m					17.5		
18	D- 18.0-18.45 m	9	2,3/2,3,4,4			18		
18.5						18.5		
19						19		
19.5	D- 19.5-19.95 m	12	3,3/3,3,3,3			19.5		
20						20		
20.5						20.5		
21	D- 21.0-21.45 m	22	2,5/5,5,6,6		Stiff brown occasionally laminated slightly sandy CLAY.	21		
21.5						21.5		



BOREHOLE LOG CP2 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
22	D- 22.5-22.95 m					22		
22.5		22	4,5/5,4,6,7			22.5		
23						23		
23.5						23.5		
24	D- 24.0-24.45 m	27	5,5/7,7,6,7			24		
24.5						24.5		
25						25		
25.5					Terminated at 25.45m.	25.5		
26						26		
26.5						26.5		
27						27		
27.5						27.5		
28						28		
28.5						28.5		
29						29		
29.5						29.5		
30						30		
30.5						30.5		
31						31		
31.5						31.5		
32						32		
32.5						32.5		
33						33		
33.5						33.5		



BOREHOLE LOG CP3 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 4/8/25 - 6/8/25	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER Lundy Site Investigation	ELEVATION
CLIENT B&E Boys Ltd	DIA - CP 150mm - 25.00m	
DRILLING METHOD Cable Percussion		LOGGED BY PC
LOCATION CP3	DEPTH 25.45m	CHECKED BY MB

Remarks 1. Location cleared of services prior using a CAT & Genny. **Casing - CP** 150mm - 25.00m

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
0.5	D- 0.00 m D- 0.10 m D- 0.40 m				TARMACADAM CONCRETE. MADE GROUND: Light grey angular to subangular fine to coarse gravel of mudstone and limestone.	0.5		
1	D- 1.00 m D- 1.20 m	15	2,3/3,3,4,5		At 0.80 m, plastic membrane. Orangish brown gravelly fine to medium SAND.	1		
1.5					Brown mottled yellow silty fine to coarse SAND and subangular to subrounded fine to medium GRAVEL of siltstone, sandstone and feldspar.	1.5		
2	D- 2.00 m	24	3,4/4,5,7,8		Brown gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of siltstone and sandstone.	2		
2.5						2.5		
3	D- 3.00 m	32	3,6/6,8,9,9		Brown silty very clayey fine to coarse SAND.	3		
3.5						3.5		
4						4		
4.5						4.5		
5						5		
5.5						5.5		
6	D- 6.00 m	16	2,2/3,4,4,5		Soft greyish brown slightly sandy CLAY with lenses of fine to coarse sand.	6		
6.5						6.5		
7		13	2,2/3,3,3,4			7		
7.5						7.5		
8		11	2,2/3,2,3,3			8		
8.5						8.5		
9		10	2,2/2,2,3,3			9		
9.5						9.5		
10						10		



BOREHOLE LOG CP3 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

GEO-ENVIRONMENTAL CONSULTING								
Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
10	D- 12.00 m			▽		10		
10.5		10	1,2/2,3,3,2			10.5		
11						11		
11.5			11.5					
12	D- 13.50 m	11	2,2/2,3,2,4		Firm greyish brown silty slightly sandy laminated CLAY with fine to coarse sand bands.	12		
12.5					12.5			
13					13			
13.5	D- 15.00 m	6	1,1/1,1,2,2		Brown slightly silty fine to coarse SAND and angular to subrounded fine to coarse GRAVEL of siltstone, sandstone and feldspar.	13.5		
14					14			
14.5					14.5			
15	D- 18.00 m	5	1,1/1,1,2,1		Orangish brown slightly silty fine to coarse SAND.	15		
15.5						15.5		
16						16		
16.5	D- 18.50 m	6	1,1/1,1,2,2		Stiff brown slightly sandy gravelly CLAY.	16.5		
17						17		
17.5						17.5		
18		10	1,1/2,4,2,2		Orangish brown fine to coarse SAND with occasional subangular fine gravel of quartz.	18		
18.5			18.5					
19			19					
19.5		8	1,1/2,3,2,1		19.5			
20					20			
20.5					20.5			
21		10	2,2/2,3,2,3		21			
21.5					21.5			



BOREHOLE LOG CP3 (Cable Percussion)

GEO-ENVIRONMENTAL CONSULTING

Depth (m)	Samples/ In-situ testing	SPT N value	SPT values	Water Strike	Material Description	Depth (m)	Geology code	Well Diagram
22	D- 22.00 m				Stiff greyish brown laminated CLAY.	22		
22.5		50	15,10(70mm)/ 16,17,17(50mm)			22.5		
23						23		
23.5	D- 24.00 m					23.5		
24		40	6,8/9,9,10,12			24		
24.5						24.5		
25	D- 25.00 m	37	7,8/8,9,10,10		Below 25.00m, sandy.	25		
25.5					Terminated at 25.45m.	25.5		
26						26		
26.5						26.5		
27						27		
27.5						27.5		
28						28		
28.5						28.5		
29						29		
29.5						29.5		
30						30		
30.5						30.5		
31						31		
31.5						31.5		
32						32		
32.5						32.5		
33						33		
33.5						33.5		



GEO-ENVIRONMENTAL CONSULTANTS - TRIAL PIT

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 12/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	MACHINE SI Ground Investigation Ltd	ORIENTATION
CLIENT B & E Boys Ltd	LOCATION SA1	DIMENSIONS 0.60m X 1.50m
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	METHOD Trial Pit	LOGGED BY PC
	TOTAL DEPTH 1.50m	CHECKED BY MB

Remarks: 1. Location cleared of services prior using a CAT & Genny. 2. No water strikes encountered.

Depth (m)	Samples	In-Situ testing	Water Strike	Material Description	Depth (m)	Graphic Log	Backfill
0.2	ES = 0.15			Grass over MADE GROUND: Brown sandy silty angular to subangular fine to coarse gravel of silstone and limestone.	0.5		
0.4				MADE GROUND: Brown sandy angular to subangular fine to coarse gravel of brick, limestone and sandstone.			
0.6	ES = 0.50						
0.8							
1				Light brown fine to medium SAND.	1		
1.2							
1.4	D = 1.50				1.5		
1.6				Terminated depth: 1.50m.			
1.8							
2					2		
2.2							
2.4					2.5		
2.6							
2.8							
3					3		
3.2							
3.4					3.5		
3.6							
3.8							
4					4		
4.2							
4.4					4.5		
4.6							
4.8							



GEO-ENVIRONMENTAL CONSULTANTS - TRIAL PIT

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 12/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	MACHINE SI Ground Investigation Ltd	ORIENTATION
CLIENT B & E Boys Ltd	LOCATION SA2	DIMENSIONS 0.60m X 1.50m
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	METHOD Trial Pit	LOGGED BY PC
	TOTAL DEPTH 1.50m	CHECKED BY MB

Remarks: 1. Location cleared of services prior using a CAT & Genny. 2. No water strikes encountered.

Depth (m)	Samples	In-Situ testing	Water Strike	Material Description	Depth (m)	Graphic Log	Backfill
0.2	ES = 0.20			Grass over MADE GROUND: Brown sandy silty angular to subangular fine to coarse gravel of silstone and limestone.	0.5		
0.4				MADE GROUND: Brown sandy angular to subangular fine to coarse gravel of brick, limestone and sandstone.			
0.6	ES = 0.60						
0.8				Light brown fine to medium SAND.	1		
1	D = 1.00						
1.2							
1.4					1.5		
1.6				Terminated depth: 1.50m.			
1.8					2		
2							
2.2					2.5		
2.4							
2.6					3		
2.8							
3					3.5		
3.2							
3.4					4		
3.6							
3.8					4.5		
4							
4.2							
4.4							
4.6							
4.8							



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 6/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER SI Ground Investigation Ltd	SURFACE ELEVATION
CLIENT B & E Boys Ltd	LOCATION WS1	LOGGED BY PC
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	DRILLING METHOD Windowless Sample Borehol	CHECKED BY MB
	TOTAL DEPTH 4.45m	

COMPLETION Gas/ Groundwater Monitoring.	CASING N/A
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Remarks: 1. Location cleared of services prior using a CAT & Genny. 2. No water strikes encountered.

Depth (m)	In-Situ testing	Samples/ Test	SPT values	Water Strike	Material Description	Depth (m)	Geology Code	Well Install
0.5		ES= 0.40			TARAMACADAM. CONCRETE with rebar.	0.5		
					MADE GROUND: Brown mottled grey sandy angular to subangular fine to coarse gravel of concrete, sandstone and limestone.			
1		D = 0.80			Brown gravelly slightly silty medium to coarse SAND. Gravel is subrounded to rounded fine to coarse of siltstone and sandstone.	1		
		SPT (C) N= 20	3,4/5,5,5,5					
1.5						1.5		
2		SPT (C) N= 23 D= 2.50	5,5/5,6,6,6		Light brown fine to medium SAND.	2		
2.5						2.5		
3		SPT (C) N= 24	3,4/6,6,6,6			3		
3.5						3.5		
4		SPT (C) N= 34	5,7/7,9,8,10			4		
4.5					Termination Depth at: 4.45m	4.5		
5						5		
5.5						5.5		



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 6/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER SI Ground Investigation Ltd	SURFACE ELEVATION
CLIENT B & E Boys Ltd	LOCATION WS3	LOGGED BY PC
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	DRILLING METHOD Windowless Sample Borehol	CHECKED BY MB
	TOTAL DEPTH 4.45m	

COMPLETION Gas/ Groundwater Monitoring.	CASING N/A
--	-------------------

Remarks: 1. Location cleared of services prior using a CAT & Genny. 2. No water strikes encountered.

Depth (m)	In-Situ testing	Samples/ Test	SPT values	Water Strike	Material Description	Depth (m)	Geology Code	Well Install
0.5		ES= 0.40			TARAMACADAM.	0.5		
					CONCRETE with rebar.			
1		SPT (C) N= 18 D = 1.00	3,4/4,4,5,5		MADE GROUND: Grey angular to subangular gravel of limestone.	1		
1.5					Brown gravelly slightly silty medium to coarse SAND. Gravel is subrounded to rounded fine to coarse of siltstone and sandstone.	1.5		
2		SPT (C) N= 21	4,5/5,5,5,6		Below 1.50m, slightly clayey pockets.	2		
2.5						2.5		
3		SPT (C) N= 23 D = 3.50	4,4/5,6,6,6			3		
3.5						3.5		
4		SPT (C) N= 27	4,5/6,6,7,8			4		
4.5					Termination Depth at: 4.45m	4.5		
5						5		
5.5						5.5		



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 6/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER SI Ground Investigation Ltd	SURFACE ELEVATION
CLIENT B & E Boys Ltd	LOCATION WS4	LOGGED BY PC
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	DRILLING METHOD Windowless Sample Borehol	CHECKED BY MB
	TOTAL DEPTH 4.45m	

COMPLETION Gas/ Groundwater Monitoring. **CASING** N/A

Remarks: 1. Location cleared of services prior using a CAT & Genny.

Depth (m)	In-Situ testing	Samples/ Test	SPT values	Water Strike	Material Description	Depth (m)	Geology Code	Well Install
0.5		ES= 0.50			TARAMACADAM. CONCRETE with rebar.	0.5		
1		SPT (C) N= 20 D = 1.00	5,5/5,6,6,6		MADE GROUND: Brown mottled grey sandy angular to subangular fine to coarse gravel of concrete, sandstone and limestone.	1		
1.5					Brown gravelly slightly silty medium to coarse SAND. Gravel is subrounded to rounded fine to coarse of siltstone and sandstone.	1.5		
2		SPT (C) N= 23	6,6/6,7,7,7			2		
2.5						2.5		
3		SPT (C) N= 24 D = 3.00	5,5/6,6,7,7	▽ No Rise.	Below 2.80m, slightly clayey pockets.	3		
3.5						3.5		
4		SPT (C) N= 34	5,6/6,8,8,8			4		
4.5					Termination Depth at: 4.45m	4.5		
5						5		
5.5						5.5		



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 12/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER SI Ground Investigation Ltd	SURFACE ELEVATION
CLIENT B & E Boys Ltd	LOCATION FP1	LOGGED BY PC
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	DRILLING METHOD Foundation pit	CHECKED BY MB
	TOTAL DEPTH 1.00m	

COMPLETION Gas/ Groundwater Monitoring.	CASING N/A
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Remarks: 1. Location cleared of services prior using a CAT & Genny. 2. No water strikes encountered.

Depth (m)	In-Situ testing	Samples/ Test	SPT values	Water Strike	Material Description	Depth (m)	Geology Code	Well Install
0.5		D= 0.40			CONCRETE with rebar.	0.5		
					MADE GROUND: Grey sandy angular to subangular fine to coarse gravel of limestone.			
		D= 0.80			Light brown fine to medium SAND.			
1					Termination Depth at: 1.00m	1		
1.5						1.5		
2						2		
2.5						2.5		
3						3		
3.5						3.5		
4						4		
4.5						4.5		
5						5		
5.5						5.5		



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 6/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER SI Ground Investigation Ltd	SURFACE ELEVATION
CLIENT B & E Boys Ltd	LOCATION FP2	LOGGED BY PC
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	DRILLING METHOD Foundation pit	CHECKED BY MB
	TOTAL DEPTH 1.20m	

COMPLETION Gas/ Groundwater Monitoring.	CASING N/A
--	-------------------

Remarks: 1. Location cleared of services prior using a CAT & Genny. 2. No water strikes encountered.

Depth (m)	In-Situ testing	Samples/ Test	SPT values	Water Strike	Material Description	Depth (m)	Geology Code	Well Install
0.5		ES= 0.40			TARAMACADAM. CONCRETE with rebar. MADE GROUND: Grey sandy angular to subangular fine to coarse gravel of limestone. Light brown medium to coarse SAND.	0.5		
1		D= 1.00				1		
1.5					Termination Depth at: 1.20m	1.5		
2						2		
2.5						2.5		
3						3		
3.5						3.5		
4						4		
4.5						4.5		
5						5		
5.5						5.5		



GEO-ENVIRONMENTAL CONSULTANTS

GEO-ENVIRONMENTAL CONSULTING

PROJECT NUMBER 25124	DATE 6/08/2025	COORDINATES
PROJECT NAME Hanson Springs, Rochdale	DRILLER SI Ground Investigation Ltd	SURFACE ELEVATION
CLIENT B & E Boys Ltd	LOCATION FP3	LOGGED BY PC
ADDRESS Land at Hanson Springs, Gorrels Way, Rochdale OL11 2PX	DRILLING METHOD Foundation pit	CHECKED BY MB
	TOTAL DEPTH 1.20m	

COMPLETION Gas/ Groundwater Monitoring. **CASING** N/A

Remarks: 1. Location cleared of services prior using a CAT & Genny. 2. No water strikes encountered.

Depth (m)	In-Situ testing	Samples/ Test	SPT values	Water Strike	Material Description	Depth (m)	Geology Code	Well Install
0.5					TARAMACADAM.	0.5		
					CONCRETE with rebar.			
					MADE GROUND: Brown mottled grey sandy angular to subangular fine to coarse gravel of concrete, sandstone and limestone. Cobbles of subangular to subrounded sandstone and siltstone.			
1		ES= 1.00				1		
1.5					Termination Depth at: 1.20m	1.5		
2						2		
2.5						2.5		
3						3		
3.5						3.5		
4						4		
4.5						4.5		
5						5		
5.5						5.5		

APPENDIX B

Chemical Test Results

FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 25/08786
Issue Number: 1
Date: 19 August, 2025

Client: BEK Enviro Ltd
2 Landwick Court
Metcalf Drive
Altham Business Park
Altham
Lancashire
BB5 5GY

Project Manager: ** USE THIS Mick Buckley/James Mashiter
Project Name: Hanson Springs, Rochdale (HSR)
Project Ref: N/A
Order No: 8739-25124-PC/SS
Date Samples Received: 08/08/25
Date Instructions Received: 11/08/25
Date Analysis Completed: 19/08/25

Approved by:



Richard Wong
Client Manager

Envirolab Job Number: 25/08786

Client Project Name: Hanson Springs, Rochdale (HSR)

Client Project Ref: N/A

Lab Sample ID	25/08786/1	25/08786/2	25/08786/3	25/08786/4	25/08786/5	25/08786/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS1	WS3	WS4	HP3	WS1	WS3				
Depth to Top	0.80	1.00	0.50	1.00	0.40	0.40				
Depth To Bottom										
Date Sampled	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25				
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOLID				
Sample Matrix Code	1A	1	6A	1A	1A	7				
% Stones >10mm _A	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		% w/w	0.1	A-T-044
Asbestos in soil _D [#]	NAD	NAD	NAD	NAD	NAD	NAD ^U				A-T-045
Asbestos Matrix (visual) _D	-	-	-	-	-	-				A-T-045
Asbestos Matrix (microscope) _D	-	-	-	-	-	-				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
pH _D ^{M#}	8.59	8.48	11.03	8.68	11.61	9.22 ^U		pH	0.01	A-T-031s
Sulphate (water sol 2:1) _D ^{M#}	<0.01	<0.01	0.06	<0.01	0.06	0.02 ^U		g/l	0.01	A-T-026s
Sulphate (acid soluble) _D ^{M#}	<200	<200	390	<200	420	<200 ^U		mg/kg	200	A-T-028s
Cyanide (total) _A ^{M#}	<1	<1	<1	<1	<1	<1 ^U		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#}	0.25	0.81	1.59	0.36	1.84	1.33 ^U		% w/w	0.14	A-T-032s
Arsenic _D ^{M#}	2	2	<1	3	1	<1 ^U		mg/kg	1	A-T-024s
Boron (water soluble) _D ^{M#}	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0 ^U		mg/kg	1	A-T-027s
Cadmium _D	<1.0	<1.0	<1.0	<1.0	<1.0	1.0		mg/kg	1	A-T-024s
Copper _D ^{M#}	9	4	10	12	9	8 ^U		mg/kg	1	A-T-024s
Chromium _D ^{M#}	17	3	16	12	16	21 ^U		mg/kg	1	A-T-024s
Chromium (hexavalent) _D	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-040s
Lead _D ^{M#}	5	3	12	10	6	6 ^U		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#}	12	4	21	16	18	27 ^U		mg/kg	1	A-T-024s
Selenium _D ^{M#}	<1	<1	<1	<1	<1	<1 ^U		mg/kg	1	A-T-024s
Zinc _D ^{M#}	24	12	46	45	35	103 ^U		mg/kg	1	A-T-024s

Envirolab Job Number: 25/08786

Client Project Name: Hanson Springs, Rochdale (HSR)

Client Project Ref: N/A

Lab Sample ID	25/08786/1	25/08786/2	25/08786/3	25/08786/4	25/08786/5	25/08786/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS1	WS3	WS4	HP3	WS1	WS3				
Depth to Top	0.80	1.00	0.50	1.00	0.40	0.40				
Depth To Bottom										
Date Sampled	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25				
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOLID				
Sample Matrix Code	1A	1	6A	1A	1A	7				
PAH-16MS										
Acenaphthene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-019s
Acenaphthylene _A ^{M#}	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-019s
Anthracene _A ^{M#}	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02 ^U		mg/kg	0.02	A-T-019s
Benzo(a)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04 ^U		mg/kg	0.04	A-T-019s
Benzo(a)pyrene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04 ^U		mg/kg	0.04	A-T-019s
Benzo(b)fluoranthene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05 ^U		mg/kg	0.05	A-T-019s
Benzo(ghi)perylene _A ^{M#}	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05 ^U		mg/kg	0.05	A-T-019s
Benzo(k)fluoranthene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07 ^U		mg/kg	0.07	A-T-019s
Chrysene _A ^{M#}	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06 ^U		mg/kg	0.06	A-T-019s
Dibenzo(ah)anthracene _A ^{M#}	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04 ^U		mg/kg	0.04	A-T-019s
Fluoranthene _A ^{M#}	<0.08	<0.08	<0.08	<0.08	0.11	<0.08 ^U		mg/kg	0.08	A-T-019s
Fluorene _A ^{M#}	<0.01 ^U	<0.01 ^U	<0.01 ^U	<0.01 ^U	<0.01 ^U	<0.01 ^U		mg/kg	0.01	A-T-019s
Indeno(123-cd)pyrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03 ^U		mg/kg	0.03	A-T-019s
Naphthalene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03 ^U		mg/kg	0.03	A-T-019s
Phenanthrene _A ^{M#}	<0.03	<0.03	<0.03	<0.03	0.20	<0.03 ^U		mg/kg	0.03	A-T-019s
Pyrene _A ^{M#}	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07 ^U		mg/kg	0.07	A-T-019s
Total PAH-16MS _A ^{M#}	<0.08	<0.08	<0.08	<0.08	0.31	<0.08 ^U		mg/kg	0.01	A-T-019s

Envirolab Job Number: 25/08786

Client Project Name: Hanson Springs, Rochdale (HSR)

Client Project Ref: N/A

Lab Sample ID	25/08786/1	25/08786/2	25/08786/3	25/08786/4	25/08786/5	25/08786/6		Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS1	WS3	WS4	HP3	WS1	WS3				
Depth to Top	0.80	1.00	0.50	1.00	0.40	0.40				
Depth To Bottom										
Date Sampled	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25	06-Aug-25				
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOLID				
Sample Matrix Code	1A	1	6A	1A	1A	7				
TPH CWG with Clean Up										
Ali >C5-C6 _A	<0.01	<0.01	<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	<0.01	<0.01		mg/kg	0.01	A-T-022s
Ali >C8-C10 _A	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-055s
Ali >C10-C12 _A ^{M#}	<1	<1	<1	<1	<1	<1 ^U		mg/kg	1	A-T-055s
Ali >C12-C16 _A ^{M#}	<1	<1	<1	<1	5	<1 ^U		mg/kg	1	A-T-055s
Ali >C16-C21 _A ^{M#}	<1	<1	<1	<1	7	<1 ^U		mg/kg	1	A-T-055s
Ali >C21-C35 _A ^{M#}	6	2	9	<1	48	13 ^U		mg/kg	1	A-T-055s
Total Aliphatics _A	6	2	9	<1	61	13		mg/kg	1	Calc-As Recd
Aro >C5-C7 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-022s
Aro >C7-C8 _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-022s
Aro >C8-C10 _A	<1	<1	8	<1	3	42		mg/kg	1	A-T-055s
Aro >C10-C12 _A	<1	<1	<1	<1	<1	<1		mg/kg	1	A-T-055s
Aro >C12-C16 _A	<1	<1	<1	<1	4	<1		mg/kg	1	A-T-055s
Aro >C16-C21 _A ^{M#}	<1	<1	<1	<1	4	<1 ^U		mg/kg	1	A-T-055s
Aro >C21-C35 _A ^{M#}	2	1	3	<1	17	3 ^U		mg/kg	1	A-T-055s
Total Aromatics _A	2	1	11	<1	29	45		mg/kg	1	Calc-As Recd
TPH (Ali & Aro >C5-C35) _A	8	3	21	<1	89	58		mg/kg	1	Calc-As Recd
BTEX - Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-022s
BTEX - Toluene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-022s
BTEX - Ethyl Benzene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-022s
BTEX - m & p Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-022s
BTEX - o Xylene _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		mg/kg	0.01	A-T-022s
MTBE _A [#]	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 ^U		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 client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- 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 within the same delivery, will be disposed of **four weeks** after the 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 our scope of accreditation.
- A deviating sample 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.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: 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

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

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 by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.

Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

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.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: BEK Enviro Ltd, 2 Landwick Court, Metcalfe Drive, Altham Business Park,
Altham, Lancashire , BB5 5GY

Project: Hanson Springs, Rochdale (HSR)

Clients Project No: N/A

Project No: 25/08786

Date Received: 11/08/2025 (am)

Cool Box Temperatures (°C): 16.7

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.

Envirolab Analysis Dates

Lab Sample ID	25/08786/1	25/08786/2	25/08786/3	25/08786/4	25/08786/5	25/08786/6
Client Sample No						
Client Sample ID/Depth	WS1 0.80m	WS3 1.00m	WS4 0.50m	HP3 1.00m	WS1 0.40m	WS3 0.40m
Date Sampled	06/08/25	06/08/25	06/08/25	06/08/25	06/08/25	06/08/25
A-T-004s					14/08/2025	14/08/2025
A-T-007s					15/08/2025	15/08/2025
A-T-019s	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025
A-T-022s	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025
A-T-024s	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025
A-T-025w					19/08/2025	19/08/2025
A-T-026s	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025
A-T-026w					19/08/2025	19/08/2025
A-T-026w (F)					19/08/2025	19/08/2025
A-T-027s	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025
A-T-028s	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025
A-T-030s					18/08/2025	18/08/2025
A-T-031s	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025
A-T-031w					19/08/2025	19/08/2025
A-T-032s	18/08/2025	18/08/2025	18/08/2025	18/08/2025	18/08/2025	18/08/2025
A-T-032w					19/08/2025	19/08/2025
A-T-037w					19/08/2025	19/08/2025
A-T-040s	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025	14/08/2025
A-T-042sTCN	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025
A-T-044	19/08/2025	19/08/2025	19/08/2025	19/08/2025	19/08/2025	19/08/2025
A-T-045	12/08/2025	12/08/2025	12/08/2025	12/08/2025	12/08/2025	12/08/2025
A-T-050s	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025	15/08/2025
A-T-050w					19/08/2025	19/08/2025
A-T-055s	18/08/2025	18/08/2025	18/08/2025	18/08/2025	18/08/2025	18/08/2025
A-T-ANCs					18/08/2025	18/08/2025
Calc-As Recd	18/08/2025	18/08/2025	18/08/2025	18/08/2025	18/08/2025	18/08/2025
Calc-no stones					19/08/2025	19/08/2025
Probe (w)					19/08/2025	19/08/2025

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

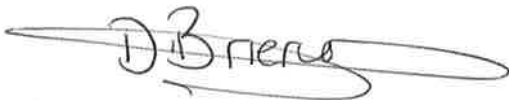
FINAL ANALYTICAL TEST REPORT

Envirolab Job Number: 25/08939
Issue Number: 1
Date: 27 August, 2025

Client: BEK Enviro Ltd
2 Landwick Court
Metcalf Drive
Altham Business Park
Altham
Lancashire
BB5 5GY

Project Manager: ** USE THIS Mick Buckley/James Mashiter
Project Name: Hanson Springs
Project Ref: N/A
Order No: 8748-25124-MLM
Date Samples Received: 14/08/25
Date Instructions Received: 15/08/25
Date Analysis Completed: 27/08/25

Approved by:



Danielle Brierley
Client Services Supervisor

Envirolab Job Number: 25/08939

Client Project Name: Hanson Springs

Client Project Ref: N/A

Lab Sample ID	25/08939/1							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS4									
Depth to Top										
Depth To Bottom										
Date Sampled	13-Aug-25									
Sample Type	WATER - GW									
Sample Matrix Code	N/A									
pH (w) [#]	7.87							pH	0.01	A-T-031w
Ammoniacal nitrogen as N (w) [#]	0.06							mg/l	0.05	A-T-033w
Chloride (w) [#]	68							mg/l	1	A-T-026w
Sulphate (w) [#]	67							mg/l	1	A-T-026w
Cyanide (total) (w) [#]	<0.005							mg/l	0.005	A-T-042wTCN
Phenols - Total by HPLC (w) _A	<0.01							mg/l	0.01	A-T-050w
DOC - Dissolved Organic Carbon (w) [#]	9.8							mg/l	2	A-T-032w
Arsenic (dissolved) _A [#]	3							µg/l	1	A-T-025w
Boron (dissolved) _A [#]	138							µg/l	10	A-T-025w
Cadmium (dissolved) _A [#]	<0.2							µg/l	0.2	A-T-025w
Copper (dissolved) _A [#]	<4							µg/l	4	A-T-025w
Chromium (dissolved) _A [#]	<1							µg/l	1	A-T-025w
Chromium (hexavalent) (w) _A [#]	<0.05							mg/l	0.05	A-T-040w
Lead (dissolved) _A [#]	<1							µg/l	0.1	A-T-025w
Mercury (dissolved) _A [#]	<0.1							µg/l	0.1	A-T-025w
Nickel (dissolved) _A [#]	<2							µg/l	2	A-T-025w
Selenium (dissolved) _A [#]	<1							µg/l	1	A-T-025w
Zinc (dissolved) _A [#]	<2							µg/l	2	A-T-025w

Envirolab Job Number: 25/08939

Client Project Name: Hanson Springs

Client Project Ref: N/A

Lab Sample ID	25/08939/1							Units	Limit of Detection	Method ref
Client Sample No										
Client Sample ID	WS4									
Depth to Top										
Depth To Bottom										
Date Sampled	13-Aug-25									
Sample Type	WATER - GW									
Sample Matrix Code	N/A									
PAH 16MS (w)										
Acenaphthene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Acenaphthylene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Anthracene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Benzo(a)anthracene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Benzo(a)pyrene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Benzo(b)fluoranthene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Benzo(ghi)perylene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Benzo(k)fluoranthene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Chrysene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Dibenzo(ah)anthracene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Fluoranthene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Fluorene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Indeno(123-cd)pyrene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Naphthalene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Phenanthrene (w) _A [#]	<0.01							µg/l	0.01	A-T-019w
Pyrene (w) _A [#]	0.01							µg/l	0.01	A-T-019w
Total PAH 16MS (w) _A [#]	0.01							µg/l	0.01	A-T-019w

Envirolab Job Number: 25/08939

Client Project Name: Hanson Springs

Client Project Ref: N/A

Lab Sample ID	25/08939/1									
Client Sample No										
Client Sample ID	WS4									
Depth to Top										
Depth To Bottom										
Date Sampled	13-Aug-25									
Sample Type	WATER - GW									
Sample Matrix Code	N/A									
TPH CWG (w) with Clean Up										
Ali >C5-C6 (w) _A [#]	<1							µg/l	1	A-T-022w
Ali >C6-C8 (w) _A [#]	<1							µg/l	1	A-T-022w
Ali >C8-C10 (w) _A [#]	<5							µg/l	5	A-T-055w
Ali >C10-C12 (w) _A [#]	<5							µg/l	5	A-T-055w
Ali >C12-C16 (w) _A [#]	<5							µg/l	5	A-T-055w
Ali >C16-C21 (w) _A [#]	5							µg/l	5	A-T-055w
Ali >C21-C35 (w) _A [#]	154							µg/l	5	A-T-055w
Total Aliphatics (w) _A [#]	159							µg/l	5	Calc-As Recd
Aro >C5-C7 (w) _A [#]	<1							µg/l	1	A-T-022w
Aro >C7-C8 (w) _A [#]	<1							µg/l	1	A-T-022w
Aro >C8-C10 (w) _A	10							µg/l	5	A-T-055w
Aro >C10-C12 (w) _A [#]	6							µg/l	5	A-T-055w
Aro >C12-C16 (w) _A [#]	12							µg/l	5	A-T-055w
Aro >C16-C21 (w) _A [#]	15							µg/l	5	A-T-055w
Aro >C21-C35 (w) _A [#]	18							µg/l	10	A-T-055w
Total Aromatics (w) _A [#]	61							µg/l	10	Calc-As Recd
TPH (Ali & Aro >C5-C35) (w) _A	220							µg/l	10	Calc-As Recd
BTEX - Benzene (w) _A [#]	<1							µg/l	1	A-T-022w
BTEX - Toluene (w) _A [#]	<1							µg/l	1	A-T-022w
BTEX - Ethyl Benzene (w) _A [#]	<1							µg/l	1	A-T-022w
BTEX - m & p Xylene (w) _A [#]	<1							µg/l	1	A-T-022w
BTEX - o Xylene (w) _A [#]	<1							µg/l	1	A-T-022w
MTBE (w) _A [#]	<1							µg/l	1	A-T-022w

Report Notes

General

- This report shall not be reproduced, except in full, without written approval from Envirolab.
- The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
- 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 within the same delivery, will be disposed of **four weeks** after the 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 our scope of accreditation.
- A deviating sample 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.
- If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
- Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

Key

Superscript “#”	Accredited to ISO 17025
Superscript “M”	Accredited to MCertS
Superscript “U”	Individual result not accredited
None of the above symbols	Analysis unaccredited
Subscript “A”	Analysis performed on as-received Sample
Subscript “D”	Analysis performed on the dried sample, crushed to pass 2mm sieve.
Subscript “D” on Asbestos	Analysis performed on a dried aliquot of sample provided.
Subscript “A”	Analysis has dependant options against results. Details appear in the comments of your Sample receipt
IS	Insufficient Sample for analysis
US	Unsuitable Sample for analysis
NDP	No Determination Possible
NAD	No Asbestos Detected
Trace	Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh.
N/A	Not applicable

Asbestos

Identification: 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

“Trace Asbestos Identified” will be reported if there is not enough present to verify the type.

Assigned Matrix Codes

1	SAND	6	CLAY/LOAM	A	Contains Stones
2	LOAM	7	OTHER	B	Contains Construction Rubble
3	CLAY	8	Asbestos Bulk (Only Asbestos ID accredited)	C	Contains visible hydrocarbons
4	LOAM/SAND	9	Incinerator Ash (some Metals accredited)	D	Contains glass / metal
5	SAND/CLAY			E	Contains roots / twigs

Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.

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 by method A-T-007:

For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.

Results “with Clean up” indicates samples cleaned up with Silica during extraction.

EPH CWG (method A-T-055) from TPH CWG:

EPH CWG results have humics mathematically subtracted through instrument calculation.

Where these humic substances have been identified in any IDs from “TPH CWG with clean up” please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

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.

Please contact your client manager if you require any further information.

Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

Client: BEK Enviro Ltd, 2 Landwick Court, Metcalfe Drive, Altham Business Park,
Altham, Lancashire , BB5 5GY

Project: Hanson Springs

Clients Project No: N/A

Project No: 25/08939

Date Received: 15/08/2025 (am)

Cool Box Temperatures (°C): 18.4

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.

Envirolab Analysis Dates

Lab Sample ID	25/08939/1
Client Sample No	
Client Sample ID/Depth	WS4
Date Sampled	13/08/25
A-T-019w	19/08/2025
A-T-022w	19/08/2025
A-T-025w	18/08/2025
A-T-026w	20/08/2025
A-T-031w	15/08/2025
A-T-032w	27/08/2025
A-T-033w	20/08/2025
A-T-040w	20/08/2025
A-T-042wTCN	20/08/2025
A-T-050w	20/08/2025
A-T-055w	19/08/2025
Calc-As Recd	19/08/2025

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 Test Report

Envirolab Job Number: 25/08786
Issue Number: 1
Date: 19-Aug-25

Client: BEK Enviro Ltd
2 Landwick Court
Metcalf Drive
Altham Business Park
Altham
Lancashire, BB5 5GY

Project Manager: ** USE THIS Mick Buckley/James Mashiter
Project Name: Hanson Springs, Rochdale (HSR)
Project Ref: N/A
Order No: 8739-25124-PC/SS

Date Samples Received: 8-Aug-25
Date Instructions Received: 11-Aug-25
Date Analysis Completed: 19-Aug-25

Notes - Soil analysis

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

For samples with Matrix Codes 1 - 6 natural stones >10mm are removed or excluded from the sample prior to analysis and reported results corrected to a whole sample basis.

For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis.

Notes - General

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

Subscript "A" indicates analysis performed on the sample as received. "D" indicates analysis performed on the dried sample, crushed to pass a 2mm sieve, unless asbestos is found to be present in which case all analysis is performed on the sample as received.

All analysis is performed on the dried and crushed sample for samples with Matrix Code 7 and this supercedes any "A" subscripts.

All analysis is performed on the sample as received for soil samples from outside the European Union and this supercedes any "D" subscripts.

For complex, multi-compound analysis, quality control results do not always fall within chart limits for every compound and we have criteria for reporting in these situations.

If results are in italic font they are associated with such quality control failures and may be 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.

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

Secondary Matrix Codes: A = contains stones, B = contains construction rubble, C = contains visible hydrocarbons, D = contains glass/metal, E = contains roots/twigs.

IS indicates Insufficient sample for analysis, NDP indicates No Determination Possible and NAD indicates No Asbestos Detected.

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.

Please contact us if you need any further information.

HWOL TPH Code: EH_CU_1D_AL: Extractable hydrocarbons - i.e. everything extracted by the solvent(s), Clean-up - e.g. by florisil, silica gel, GC - Single coil gas chromatography, Aliphatics only

Approved by:



Richard Wong
Client Manager

Sample Details									
Lab Sample ID	Method	ISO17025	MCERTS	25/08786/5	Landfill Waste Acceptance Criteria Limits				
Client Sample Number					Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill		
Client Sample ID				WS1					
Depth to Top				0.4					
Depth to Bottom									
Date Sampled				06/08/2025					
Sample Type				Soil					
Sample Matrix Code				1A					
Solid Waste Analysis									
pH (pH Units) _D	A-T-031	N	N	11.61		-	>6	-	
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	1.3		-	to be evaluated	to be evaluated	
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.39		-	to be evaluated	to be evaluated	
Loss on Ignition (%) _D	A-T-030	N	N	1.5		-	-	10	
Total Organic Carbon (%) _D	A-T-032	N	N	1.07		3	5	6	
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	0.31		100	-	-	
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	139		500	-	-	
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-	
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-	
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic	A-T-025	N	N	0.002	0.020	0.5	2	25	
Barium	A-T-025	N	N	0.005	0.050	20	100	300	
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5	
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70	
Copper	A-T-025	N	N	<0.004	<0.04	2	50	100	
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2	
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30	
Nickel	A-T-025	N	N	<0.002	<0.02	0.4	10	40	
Lead	A-T-025	N	N	<0.001	<0.01	0.5	10	50	
Antimony	A-T-025	N	N	<0.001	<0.01	0.06	0.7	5	
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7	
Zinc	A-T-025	N	N	0.003	0.030	4	50	200	
Chloride	A-T-026	N	N	<1.00	<10	800	15000	25000	
Fluoride	A-T-026	N	N	0.2	2.0	10	150	500	
Sulphate as SO ₄	A-T-026	N	N	1	14	1000	20000	50000	
Total Dissolved Solids	A-T-035	N	N	58	580	4000	60000	100000	
Phenol Index	A-T-050	N	N	<0.01	<0.1	1	-	-	
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000	
Leach Test Information									
pH (pH Units)	A-T-031	N	N	10.5					
Conductivity (µS/cm)	A-T-037	N	N	116					
Mass Sample (kg)				0.179					
Dry Matter (%)	A-T-044	N	N	97.6					
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation									

Sample Details					Landfill Waste Acceptance Criteria Limits			
Lab Sample ID	Method	ISO17025	MCERTS	25/08786/6		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Client Sample Number								
Client Sample ID				WS3				
Depth to Top				0.4				
Depth to Bottom								
Date Sampled				06/08/2025				
Sample Type				Solid				
Sample Matrix Code				7				
Solid Waste Analysis								
pH (pH Units) _D	A-T-031	N	N	9.22		-	>6	-
ANC to pH 4 (mol/kg) _D	A-T-ANC	N	N	0.48		-	to be evaluated	to be evaluated
ANC to pH 6 (mol/kg) _D	A-T-ANC	N	N	0.17		-	to be evaluated	to be evaluated
Loss on Ignition (%) _D	A-T-030	N	N	1.8		-	-	10
Total Organic Carbon (%) _D	A-T-032	N	N	0.77		3	5	6
PAH Sum of 17 (mg/kg) _A	A-T-019	N	N	<0.08		100	-	-
Mineral Oil (mg/kg) _{A EH_CU_1D_AL}	A-T-007	N	N	76		500	-	-
Sum of 7 PCBs (mg/kg) _A	A-T-004	N	N	<0.007		1	-	-
Sum of BTEX (mg/kg) _A	A-T-022	N	N	<0.01		6	-	-
Eluate Analysis				10:1 mg/l	10:1 mg/kg	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic	A-T-025	N	N	<0.001	<0.01	0.5	2	25
Barium	A-T-025	N	N	0.011	0.110	20	100	300
Cadmium	A-T-025	N	N	<0.001	<0.01	0.04	1	5
Chromium	A-T-025	N	N	<0.001	<0.01	0.5	10	70
Copper	A-T-025	N	N	<0.004	<0.04	2	50	100
Mercury	A-T-025	N	N	<0.0005	<0.005	0.01	0.2	2
Molybdenum	A-T-025	N	N	<0.001	<0.01	0.5	10	30
Nickel	A-T-025	N	N	<0.002	<0.02	0.4	10	40
Lead	A-T-025	N	N	<0.001	<0.01	0.5	10	50
Antimony	A-T-025	N	N	<0.001	<0.01	0.06	0.7	5
Selenium	A-T-025	N	N	<0.001	<0.01	0.1	0.5	7
Zinc	A-T-025	N	N	0.003	0.030	4	50	200
Chloride	A-T-026	N	N	1	10	800	15000	25000
Fluoride	A-T-026	N	N	0.2	2.0	10	150	500
Sulphate as SO ₄	A-T-026	N	N	10	102	1000	20000	50000
Total Dissolved Solids	A-T-035	N	N	58	580	4000	60000	100000
Phenol Index	A-T-050	N	N	0.01	0.10	1	-	-
Dissolved Organic Carbon	A-T-032	N	N	<2.0	<200	500	800	1000
Leach Test Information								
pH (pH Units)	A-T-031	N	N	10.3				
Conductivity (µS/cm)	A-T-037	N	N	117				
Mass Sample (kg)				0.179				
Dry Matter (%)	A-T-044	N	N	97.7				
Stated acceptance limits are for guidance only and Envirolab cannot be held responsible for any discrepancies with current legislation								

APPENDIX C

Infiltration Test Results

Falling Head Permeability Test in a Standpipe

Project Name	Hanson Springs, Rochdale
Project Number	25124
Test Date	07/08/2025
Borehole ID	WS1

FIELD MEASUREMENTS

Elapsed Time, t (m)	Depth at Time, t (m)	H (m)	H/Ho
0.00	1.80	2.45	1.00
0.50	2.07	2.18	0.89
1.00	2.30	1.95	0.80
1.50	2.48	1.77	0.72
2.00	2.73	1.52	0.62
2.50	2.87	1.38	0.56
3.00	3.00	1.25	0.51
3.50	3.08	1.17	0.48
4.00	3.16	1.09	0.44
4.50	3.20	1.05	0.43
5.00	3.26	0.99	0.40
6.00	3.36	0.89	0.36
7.00	3.44	0.81	0.33
8.00	3.50	0.75	0.31
9.00	3.55	0.70	0.29
10.00	3.60	0.65	0.27
12.00	3.70	0.55	0.22
14.00	3.75	0.50	0.20
16.00	3.80	0.45	0.18
18.00	3.85	0.40	0.16
20.00	3.90	0.35	0.14
22.00	3.95	0.30	0.12
24.00	4.00	0.25	0.10
26.00	4.05	0.20	0.08
28.00	4.10	0.15	0.06
30.00	4.15	0.10	0.04
32.00	4.20	0.05	0.02
34.00	4.25	0.00	0.00

BOREHOLE INFORMATION

Depth to base of casing:	1.00 m
Depth to base of borehole before test:	4.25 m
Depth to base of borehole after test:	4.25 m
Test Section:	3.00 m
Depth to standing water:	4.25 m
Depth to induced water:	1.80 m
Diameter of Borehole (D):	0.13 m
Diameter of Piezo/Standpipe (d):	0.060 m
Test Length (L):	1.23 m
Diameter of test length (D):	0.130 m
Differential head at start of test (Ho):	2.45 m
Differential Head at end of test (Hf):	0.00 m
Time elapsed at end of test (tf):	2040 sec

PERMEABILITY CALCULATION

H/Ho < 0.37, thus permeability is calculated as a variable head test.

Therefore

Permeability, $K = A/FxT$

where

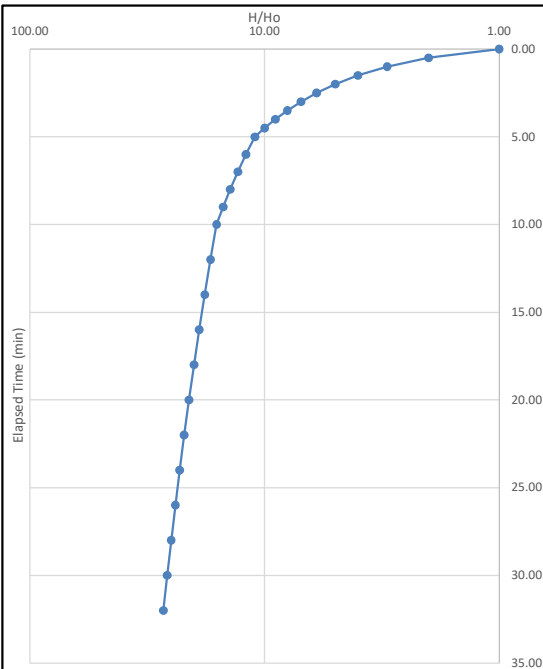
CROSS SECTIONAL BOREHOLE AREA (A) 1.33E-02 m²

SHAPE FACTOR (F) 2.97

TIME WHERE H/Ho = 0.37 (T) 1.17E+02 sec

PERMEABILITY 3.83E-05 m/sec

Comments: Approximately 50L of water added.



Falling Head Permeability Test in a Standpipe

Project Name	Hanson Springs, Rochdale
Project Number	25124
Test Date	07/08/2025
Borehole ID	WS3

FIELD MEASUREMENTS

Elapsed Time, t (m)	Depth at Time, t (m)	H (m)	H/Ho
0.00	0.53	2.04	1.00
0.50	1.26	1.31	0.64
1.00	1.60	0.97	0.48
1.50	1.80	0.77	0.38
2.00	1.89	0.68	0.33
2.50	1.98	0.59	0.29
3.00	2.04	0.53	0.26
3.50	2.06	0.51	0.25
4.00	2.08	0.49	0.24
5.00	2.12	0.45	0.22
6.00	2.14	0.43	0.21
8.00	2.18	0.39	0.19
10.00	2.23	0.34	0.17
12.00	2.27	0.30	0.15
14.00	2.30	0.27	0.13
16.00	2.34	0.23	0.11
18.00	2.37	0.20	0.10
20.00	2.40	0.17	0.08
25.00	2.52	0.05	0.02
30.00	2.59	-0.02	-0.01
35.00	2.66	-0.09	-0.04
40.00	2.77	-0.20	-0.10
45.00	2.80	-0.23	-0.11
50.00	2.91	-0.34	-0.17
60.00	2.93	-0.36	-0.18

BOREHOLE INFORMATION

Depth to base of casing:	1.00 m
Depth to base of borehole before test:	2.95 m
Depth to base of borehole after test:	2.95 m
Test Section:	1.95 m
Depth to standing water:	2.57 m
Depth to induced water:	0.53 m
Diameter of Borehole (D):	0.13 m
Diameter of Piezo/Standpipe (d):	0.060 m
Test Length (L):	1.22 m
Diameter of test length (D):	0.130 m
Differential head at start of test (Ho):	2.04 m
Differential Head at end of test (Hf):	-0.36 m
Time elapsed at end of test (tf):	3600 sec

PERMEABILITY CALCULATION

H/Ho < 0.37, thus permeability is calculated as a variable head test.

Therefore

Permeability, $K = A/FxT$

where

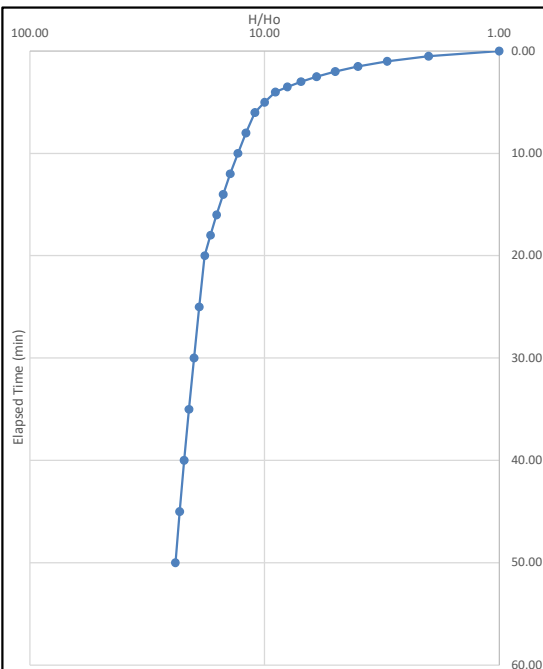
CROSS SECTIONAL BOREHOLE AREA (A) 1.33E-02 m²

SHAPE FACTOR (F) 2.96

TIME WHERE H/Ho =0.37 (T) 1.17E+02 sec

PERMEABILITY 3.84E-05 m/sec

Comments: Approximately 50L of water added.





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Soakaway Testing

Project Name	Hanson Springs, Rochdale	Location Reference:	TP01
Project Number		Test Number:	1
Test Date	12th August 2025	Weather:	Dry

FIELD MEASUREMENTS

INFILTRATION CALCULATION

Elapsed Time, t (m)

Water Level (mBGL)

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.23
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	1.95
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	1410

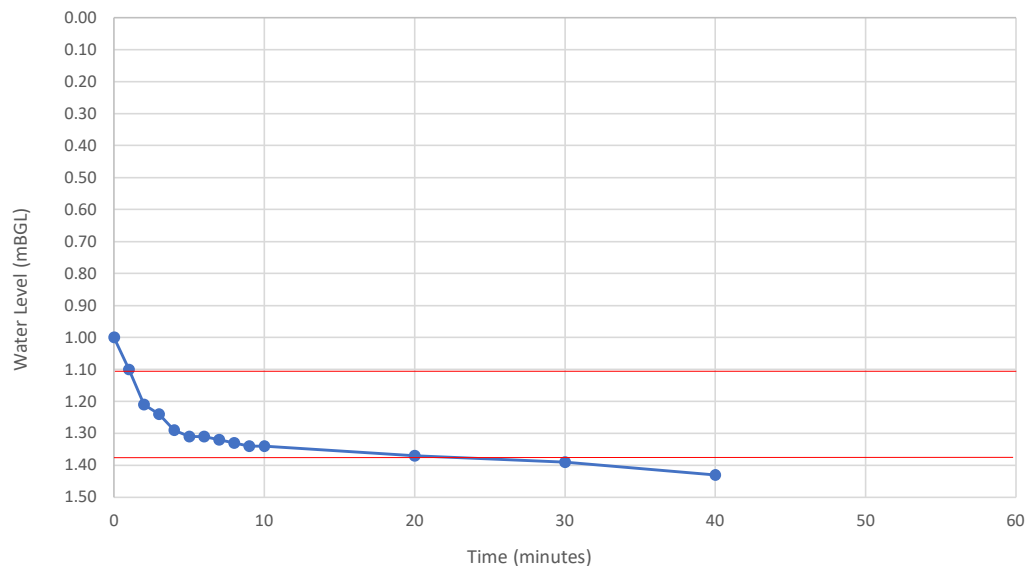
Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.50
Soakage Pit Area (m ³)	1.35

Start Water Level (mBGL)	1
Total Depth of Test (m)	0.50
75% Effective Depth (mBGL)	1.13
50% Effective Depth (m)	0.25
25% Effective Depth (mBGL)	1.38

Time at 75% Effective Depth (minutes)	1.5
Time at 25% Effective Depth (minutes)	25

INFILTRATION RATE

Soil Infiltration Rate (f)	8.18E-05
m/s	0.00008183
m/hour	0.2946





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Soakaway Testing

Project Name	Hanson Springs, Rochdale	Location Reference:	TP01
Project Number		Test Number:	2
Test Date	12th August 2025	Weather:	Dry

FIELD MEASUREMENTS

INFILTRATION CALCULATION

Elapsed Time, t (m)

Water Level (mBGL)

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.23
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	1.95
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	1620

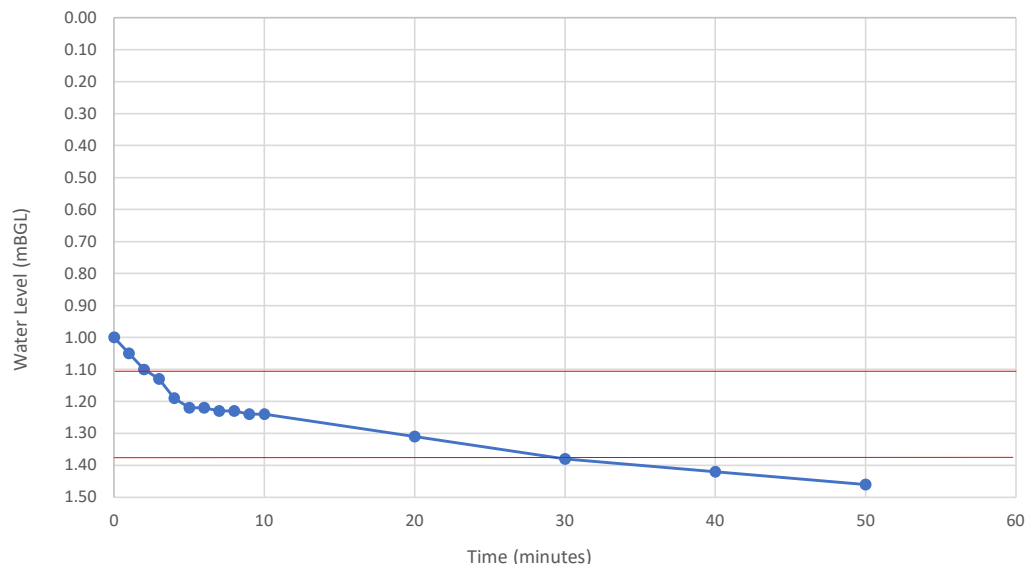
Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.50
Soakage Pit Area (m ³)	1.35

Start Water Level (mBGL)	1
Total Depth of Test (m)	0.50
75% Effective Depth (mBGL)	1.13
50% Effective Depth (m)	0.25
25% Effective Depth (mBGL)	1.38

Time at 75% Effective Depth (minutes)	3
Time at 25% Effective Depth (minutes)	30

INFILTRATION RATE

Soil Infiltration Rate (f)	7.12E-05
m/s	0.00007123
m/hour	0.2564





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Soakaway Testing

Project Name	Hanson Springs, Rochdale	Location Reference:	TP01
Project Number		Test Number:	3
Test Date	12th August 2025	Weather:	Dry

FIELD MEASUREMENTS

Elapsed Time, t (m)	Water Level (mBGL)
0	1.05
1	1.08
2	1.11
3	1.16
4	1.20
5	1.24
6	1.25
7	1.26
8	1.27
9	1.28
10	1.29
20	1.31
30	1.33
40	1.37
50	1.41
60	1.45
70	1.48
80	
90	
100	
110	
120	
130	
140	
150	
160	
170	
180	

INFILTRATION CALCULATION

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.20
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	1.85
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	2520

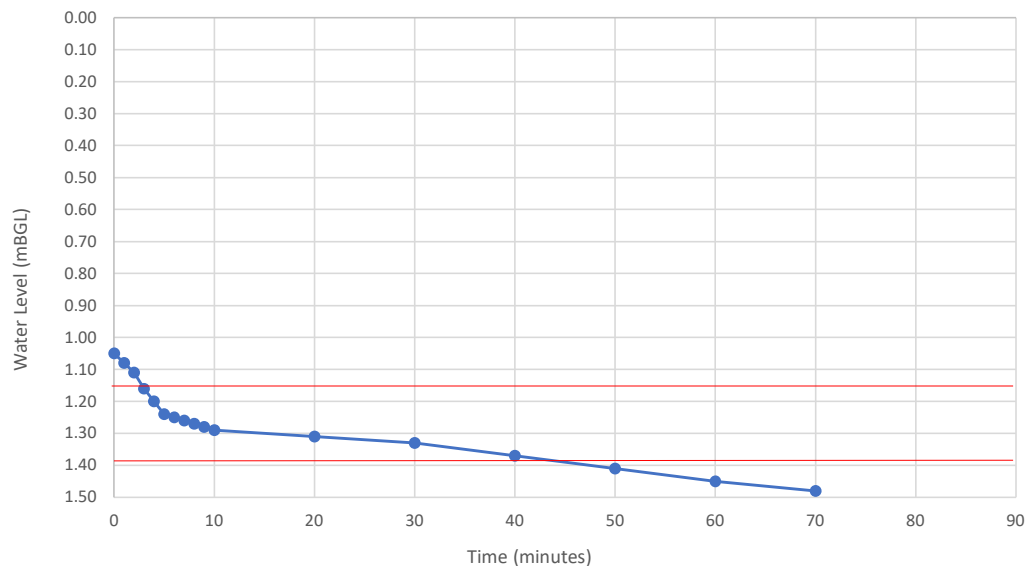
Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.50
Soakage Pit Area (m ³)	1.35

Start Water Level (mBGL)	1.05
Total Depth of Test (m)	0.45
75% Effective Depth (mBGL)	1.16
50% Effective Depth (m)	0.23
25% Effective Depth (mBGL)	1.39

Time at 75% Effective Depth (minutes)	3
Time at 25% Effective Depth (minutes)	45

INFILTRATION RATE

Soil Infiltration Rate (f)	4.36E-05
m/s	0.00004355
m/hour	0.1568





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Soakaway Testing

Project Name	Hanson Springs, Rochdale	Location Reference:	TP02
Project Number		Test Number:	1
Test Date	12th August 2025	Weather:	Dry

FIELD MEASUREMENTS

Elapsed Time, t (m)	Water Level (mBGL)
0	0.90
1	0.95
2	0.98
3	1.00
4	1.02
5	1.04
6	1.05
7	1.06
8	1.08
9	1.09
10	1.10
20	1.17
30	1.22
40	1.30
50	1.36
60	1.42
70	1.45
80	
90	
100	
110	
120	
130	
140	
150	
160	
170	
180	

INFILTRATION CALCULATION

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.27
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	2.16
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	2520

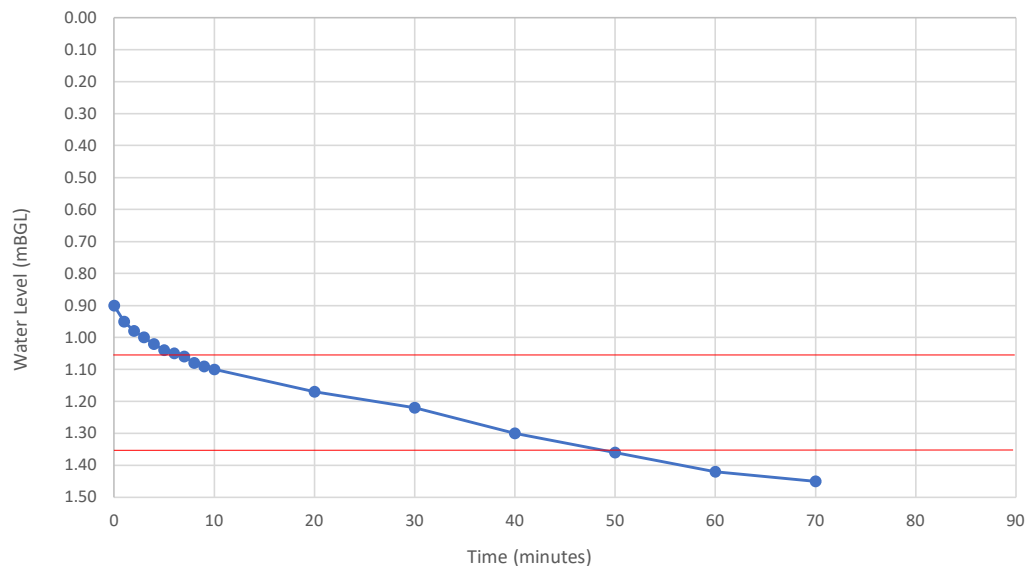
Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.50
Soakage Pit Area (m ³)	1.35

Start Water Level (mBGL)	0.9
Total Depth of Test (m)	0.60
75% Effective Depth (mBGL)	1.05
50% Effective Depth (m)	0.30
25% Effective Depth (mBGL)	1.35

Time at 75% Effective Depth (minutes)	6
Time at 25% Effective Depth (minutes)	48

INFILTRATION RATE

Soil Infiltration Rate (f)	4.96E-05
m/s	0.00004960
m/hour	0.1786





GEO-ENVIRONMENTAL CONSULTING ENGINEERS

Soakaway Testing

Project Name	Hanson Springs, Rochdale	Location Reference:	TP02
Project Number		Test Number:	2
Test Date	12th August 2025	Weather:	Dry

FIELD MEASUREMENTS

INFILTRATION CALCULATION

Elapsed Time, t (m)

Water Level (mBGL)

Calculation of Soil Infiltration Rate (f) as per BRE Digest 365 "Soakaway Design".

Using:

$$f = \frac{V_{p75-25}}{a_{p50} \times t_{p75-25}}$$

Where:

V_{p75-25}	The effective storage volume of water (m ³) in the trial pit between 75% and 25% effective depth	0.23
a_{p50}	The internal surface area of the trial pit (m ²) up to 50% effective depth and including the base area	1.95
t_{p75-25}	The time (s) for the water level to fall from 75% to 25% effective depth	#VALUE!

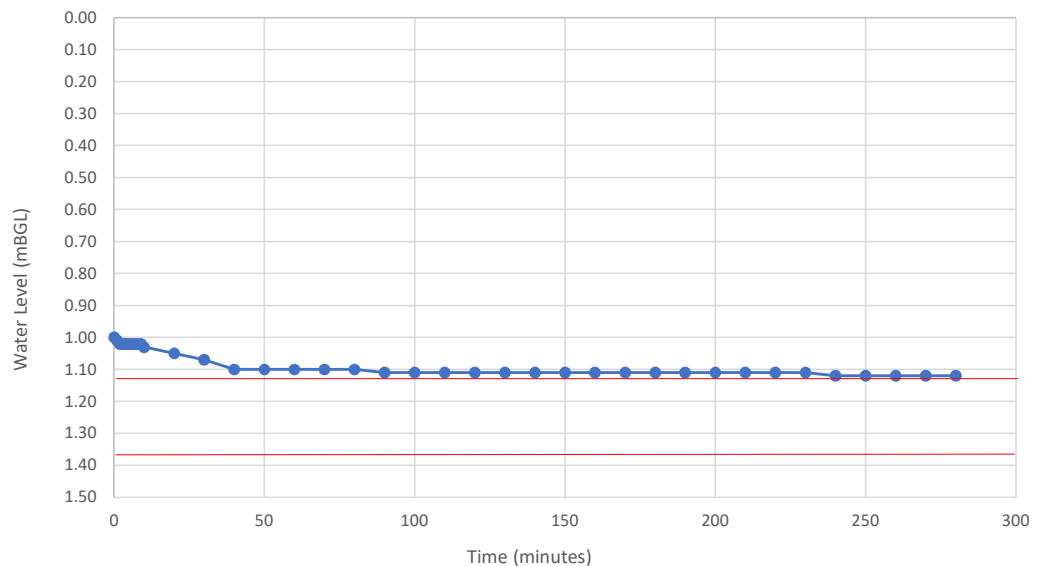
Soakage Pit Length (m)	1.50
Soakage Pit Width (m)	0.60
Soakage Pit Depth (m)	1.50
Soakage Pit Area (m ³)	1.35

Start Water Level (mBGL)	1
Total Depth of Test (m)	0.50
75% Effective Depth (mBGL)	1.13
50% Effective Depth (m)	0.25
25% Effective Depth (mBGL)	1.38

Time at 75% Effective Depth (minutes)	-
Time at 25% Effective Depth (minutes)	-

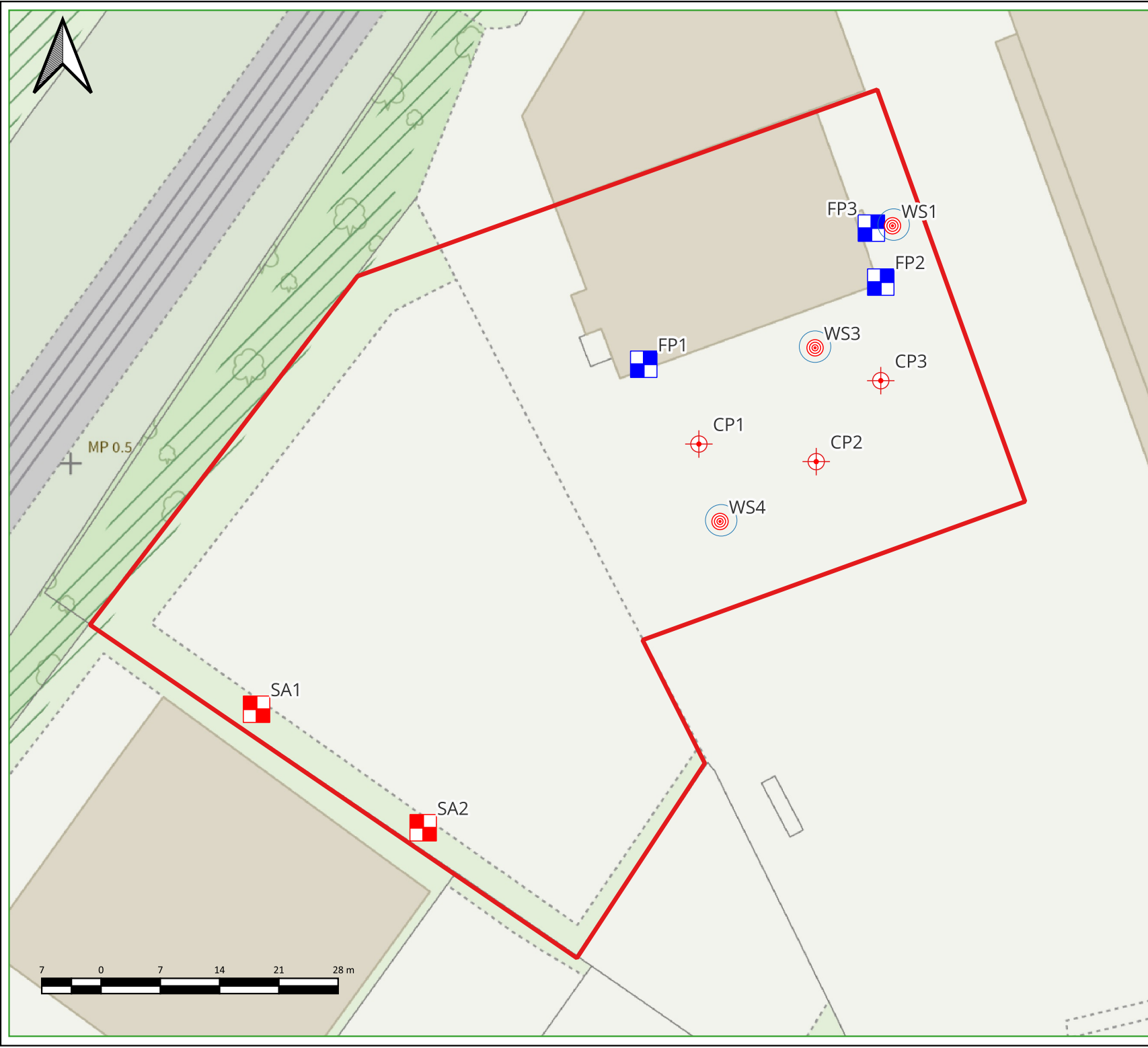
INFILTRATION RATE

Soil Infiltration Rate (f)	#VALUE!
m/s	#VALUE!
m/hour	#VALUE!



APPENDIX D

Drawings



Key

-  Site Boundary
-  Foundation Pits
-  Soakaway Locations
-  WS Borehole Locations
-  CP Borehole Locations
-  Borehole Installation

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Rev:	Description	Date	BY



GEO-ENVIRONMENTAL CONSULTING

No.2 Landwick Court, Metcalf Drive, Altham Business Park,
Lancashire, BB5 5TU

Tel: 01254 377622 Mob:07906753583

Email: mbuckley@bekenviro.co.uk

Web: www.bekenviro.co.uk

Client:
BE BOYS LTD

Job Title:
Hanson Springs, Rochdale

Drawing Title:
Intrusive Location Plan

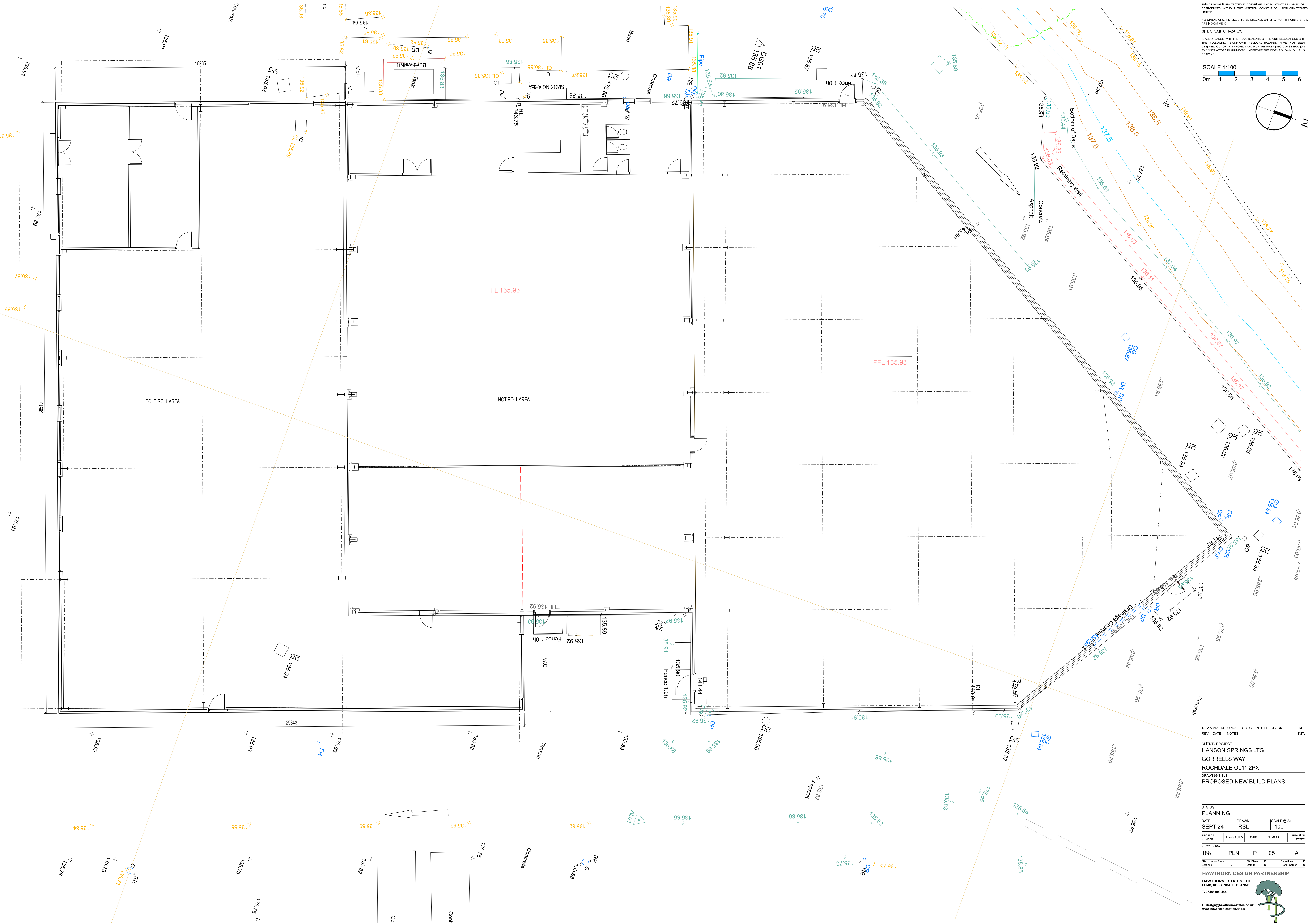
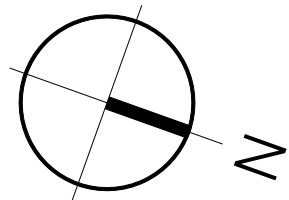
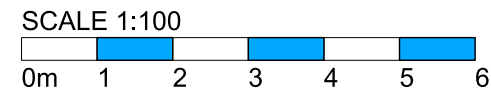
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Drawing No:
25124-3

Rev: A

SITE SPECIFIC HAZARDS

IN ACCORDANCE WITH THE REQUIREMENTS OF THE COM REGULATIONS 2015 THE FOLLOWING SIGNIFICANT RESIDUAL HAZARDS HAVE NOT BEEN IDENTIFIED OUT OF THIS PROJECT AND MUST BE TAKEN INTO CONSIDERATION BY CONTRACTORS PLANNING TO UNDERTAKE THE WORKS SHOWN ON THIS DRAWING.



REV. A 241014 UPDATED TO CLIENTS FEEDBACK RSL INT.

CLIENT / PROJECT
HANSON SPRINGS LTG
GORRELLS WAY
ROCHDALE OL11 2PX
DRAWING TITLE
PROPOSED NEW BUILD PLANS

STATUS		PLANNING		SCALE @ 1:100	
DATE	SEPT 24	DRAWN	RSL	NUMBER	05
PROJECT NUMBER	188	PLAN	PLN	TYPE	P
DRAWING NO.	188	PLAN	PLN	TYPE	P
SECTION	188	PLAN	PLN	TYPE	P
SECTION	188	PLAN	PLN	TYPE	P

HAWTHORN ESTATES LTD
LUMB, ROSSENDALE, B84 9ND
T. 08453 900 444
E. design@hawthorn-estates.co.uk
www.hawthorn-estates.co.uk

