LAND ADJACENT 315 WAKEFIELD ROAD, LEPTON, HUDDERSFIELD

PHASE II GEO-ENVIRONMENTAL AND COAL MINING LEGACY ASSESSMENT FOR JOHN FROUD

Project Ref:
EAL.83.25

Date:
September 2026

Prepared for:
John Froud
47 Cotswold Mews
Kirkburton
Huddersfield
HD8 0XE

Prepared by:		Victoria Sutton BSc *Senior Geo-Environmental Engineer*
Authorised by:		Phil Devitt BSc MSc MRICS *Director*
Date:	September 2026	
Version:	2.0	

Executive Summary

This presents the salient points of the report and should not be referred to in isolation. The conclusions and recommendations presented below are considered reasonable based on the findings of the site investigation. However, these cannot be guaranteed to gain regulatory approval and therefore copies of this report should be sent to the appropriate Regulatory Authorities and / or other organisations (as appropriate) by the Client for their comments and approval prior to undertaking any irrecoverable works associated with the subject site.

SUMMARY TABLE: PHASE II GEO-ENVIRONMENTAL AND COAL MINING LEGACY ASSESSMENT	
SITE:	Land adjacent to 315 Wakefield Road, Lepton, Huddersfield
CLIENT:	John Froud
DATE:	September 2026
REFERENCE	EAL.83.25
DEVELOPMENT PROPOSAL:	Demolition of the three existing single storey structures and construction of a single storey residential property.
HUMAN HEALTH:	No further action required.
CONTROLLED WATERS:	No further action required.
GAS RISK:	Characteristic Situation 1 – no protection measures.
FOUNDATIONS:	Foundation options are dependent on stabilisation or treatment of potential shallow workings recorded beneath the site.

The executive summary given above is an overview of the key findings and conclusions of the report. There may be other information contained in the body of the report which puts into context the findings of the executive summary. No reliance should be placed on the executive summary until the whole report has been read in full.

CONTENTS

1.0 INTRODUCTION 3

2.0 PHASE II GROUND INVESTIGATION 5

3.0 GROUND CONDITIONS 7

4.0 GROUND STABILITY ASSESSMENT – HISTORIC COAL MINING LEGACY 8

5.0 GEOTECHNICAL ASSESSMENT 9

6.0 CONTAMINATION ASSESSMENT 11

7.0 PHASE II CONCEPTUAL SITE MODEL 13

8.0 RISK MANAGEMENT & REMEDIATION 15

9.0 RECOMMENDATIONS 16

10.0 CONCLUSIONS 16

APPENDICES

Appendix A	Figures
Appendix B	Exploratory Hole Logs
Appendix C	Laboratory Analysis Results
Appendix D	Tier 1 Generic Assessment Criteria
Appendix E	Ground Gas Monitoring Data

1.0 INTRODUCTION

1.1 PREAMBLE

Erda Associates Ltd has been appointed by John Froud (hereafter referred to as 'the client') to undertake a Phase II Geo-Environmental Assessment to provide a pre-development contamination, geotechnical and historical mining legacy assessment of the site known as *Land adjacent to 315 Wakefield Road, Lepton, Huddersfield*.

Site location and boundary plans are included in **Appendix A**.

The works reported within this document comprise the review of an existing desktop study and the undertaking of an intrusive ground investigation, geotechnical testing and chemical analysis.

This document is intended to provide information that will assist decision making by identifying and recommending solutions to ground engineering and contamination issues.

The assessment has been undertaken in general accordance with current industry best practice for geo-environmental and geotechnical site investigations and is intended to support planning and engineering design decisions.

The development proposal includes demolition of the three existing single storey structures and construction of a single storey residential property.

A copy of the proposed development plan is included in **Appendix A**.

1.2 PROJECT BRIEF

The brief for the Phase II Geo-Environmental Assessment incorporates:

- Provide a strategy for, and to implement, a Phase II Environmental and Geotechnical Assessment.
- To determine any ground related geotechnical and contamination hazards that may affect the proposed development.
- Development of the Phase 2 Conceptual Model.
- To provide advice on further works required for the reduction of risks to the development and procedures likely to satisfy regulators.
- To provide an assessment of the historic mining legacy of the site in relation to the proposed development.

Whilst every effort has been made to pre-empt the likely requirements of the Local Authority and the Environment Agency, they may have specific requirements that will need to be discussed and addressed at a later date.

1.3 DATA REFERENCES

- Erda Associates Ltd, Phase I Geo-Environmental Assessment at Land at Wakefield Road, Lepton for Benjamin Allen Consulting Engineers Ltd, dated June 2025 and referenced EAL.83.25.
- Erda Associates Ltd, Coal Mining Risk Assessment at Land at Wakefield Road, Lepton for Benjamin Allen Consulting Engineers Ltd, dated June 2025 and referenced EAL.83.25.
- British Geological Survey Online Geological Mapping.
- BSI (2020), BS 5930:2015+A1 2020 Code of practice for ground investigations.
- CIRIA (2007), C665 Assessing Risks Posed by Hazardous Ground Gases to Buildings.
- PHE-BGS (2011), Joint Indicative Atlas of Radon in Great Britain.
- EA (2020), LCRM: How to assess and manage the risks from land contamination.

1.4 LIMITATIONS

This report has been produced in accordance with industry best practice at the time of writing.

In the production of this report, Erda Associates Ltd., have relied upon information provided by third parties. Erda Associates Ltd cannot accept responsibility for the reliability and authenticity of this information. Erda Associates Ltd will not be responsible for any opinions which it has expressed, or conclusions which it has drawn, in reliance upon information which is subsequently proven to be inaccurate.

All statements and opinions provided in this report have been reported in good faith and are based on the information gained during, and restrictions imposed by, site investigation techniques used at the time. Erda Associates Ltd cannot be held responsible for conditions not revealed by the investigation.

This report has been prepared for the sole use of the client and shall not be relied upon or transferred to third parties without the express written consent of Erda Associates Ltd. Unauthorised third parties rely upon the information contained within this report at their own risk.

1.5 PREVIOUS REPORTS

Erda Associates Ltd. have recently completed a Phase I Geo-Environmental Assessment & Coal Mining Risk Assessment (CMRA) for the site as referenced in Section 1.3 above. In summary, the previous desk study identified a potential low risk of contamination to future end users and controlled waters. As such it was recommended that a Phase II investigation of the site was undertaken to assess this further.

In addition, the CMRA has shown that there is a moderate risk of time independent surface instability from potential unrecorded shallow mine workings. Therefore, it was recommended that a programme of rotary probe drilling is undertaken in order to further investigate the potential risks from shallow unrecorded mine workings

The aforementioned report should be consulted in full, in conjunction with this report.

2.0 PHASE II GROUND INVESTIGATION

2.1 FIELDWORK

The Phase II intrusive investigation was undertaken on the 23rd March to 2nd April 2026 under the supervision of a suitably qualified engineer and in general accordance with the Code of Practice for Site Investigations BSI (2020), BS 5930:2015+A1 2020.

The Phase II investigation works incorporated the following:

- The advancing of three window sample boreholes with rotary follow-on (BH01 to BH03) to a maximum depth of 30.00mbgl.
- The analysis of four soil samples for a standard 'CLEA' screening suite and selected site specific determinands.
- The analysis of six samples for geotechnical design criteria including Plasticity Index (PI), water soluble sulphate and pH.
- Installation of three ground gas monitoring wells and monitoring for ground gas.

An exploratory hole location plan is contained within **Appendix A**, with all exploratory hole records presented in **Appendix B**.

2.2 RATIONALE

The Phase II investigation has been designed to facilitate an assessment of the general ground conditions across the site, including contaminant sources, pathways and receptors. The investigation has also been designed in consideration of the current site layout and access restrictions, the development proposal and health and safety issues.

The previous Phase I investigation identified the sites former use as maintenance barns. Apart from the previous maintenance barns, no further development has taken place on site.

The proposed residential development will be positioned in the location of the existing maintenance barns. The base of the maintenance barns comprised hardstanding, therefore breaking the source-pathway-receptor linkage from any potential contamination and the proposed residential end use.

On this basis, the exploratory holes were positioned within close proximity surrounding the existing barns to investigate any potential contamination associated with the barns in areas of proposed soft landscaping.

2.3 LABORATORY ANALYSIS & TESTING

Selected soil samples were analysed at specialist environmental and geotechnical laboratories as detailed in the following sections.

2.3.1 Chemical Analysis

A total four samples were sent for analysis at a UKAS/MCERTS accredited laboratory. The samples were screened for heavy metals, PAHs, TPH CWG, asbestos, water-soluble sulphate and pH. The soil analysis results are contained within **Appendix C**.

Sample ID	Depth (mbgl)	Strata	Suite
BH01	0.20	Topsoil	CLEA & TPH CWG
BH01	0.50	Natural Strata	CLEA
BH02	0.20	Topsoil	CLEA & TPH CWG
BH03	0.20	Topsoil	CLEA

Four samples were tested in alignment with standard exploratory sampling density for a single residential property of this scale and the low human health risk from the existing maintenance barns. It is considered this provides sufficient coverage to characterise localised ground

conditions at the site and allows for targeted testing should initial screen results indicate elevated contaminant levels.

Made ground was not identified within the window sample boreholes therefore shallow surface samples of topsoil were tested from areas of proposed soft landscaping.

A sample of underlying natural strata was also tested to investigate the extent of any potential contamination to the underlying natural strata.

2.3.2 Geotechnical Testing

Six samples of the natural deposits were sent to a UKAS accredited laboratory and subjected to Plasticity Index (PI) water soluble sulphate and pH testing.

The geotechnical test results are contained in **Appendix C**.

2.3.3 Gas Monitoring

A potential source of ground gas was identified during the initial Phase I assessment however due to the age of the backfill (>100 years old) this was not considered to pose a significant risk. The Phase I investigation recommended a gas membrane be installed within the proposed residential development as a precautionary measure.

However, to more accurately determine the risk of ground gas at the site, ground gas monitoring has been undertaken as part of this assessment.

3.0 GROUND CONDITIONS

The intrusive investigation has generally revealed topsoil overlying natural strata across the site.

3.1 TOPSOIL

Topsoil was recorded across the site to a maximum depth of 0.30mbgl.

3.2 SUPERFICIAL STRATA

Superficial strata was not identified within any of the boreholes.

3.3 SOLID STRATA

Solid strata anticipated to comprise the Pennine Lower Coal Measures Formation were recorded underlying the site to a maximum depth of 30.00mbgl.

The weathered upper horizons generally comprised soft brown clayey silt overlying soft yellow grey mottled orange silty sandy clay grading to firm and subsequently stiff with depth, to a maximum depth of 1.90mbgl.

The lower horizons generally comprised layers of light brown mudstone, sandstone and siltstone to a maximum depth of 30.00mbgl

Bands of coal were recorded within RBH03 at depths of 5.55m-6.40mbgl and 19.80m-20.20mbgl. No coal bands were recorded with RBH01 and RBH02 however broken ground was recorded at depths of 5.80m-6.80mbgl and 6.00m-6.85mbgl, respectively.

3.4 GROUNDWATER

Groundwater strikes were not encountered within any of the boreholes during the investigation works.

Subsequent monitoring visits did not record any groundwater, and the boreholes were recorded to be dry.

4.0 GROUND STABILITY ASSESSMENT – HISTORIC COAL MINING LEGACY

4.1 UNRECORDED WORKINGS

The lower horizons of the Pennine Lower Coal Measures generally comprised layers of light brown mudstone, sandstone and siltstone to a maximum depth of 30.00mbgl

Bands of coal were recorded within RBH03 at depths of 5.55m-6.40mbgl and 19.80m-20.20mbgl. No coal bands were recorded with RBH01 and RBH02.

Broken ground with voids and loss of flush was recorded within RBH01 and RBH02 depths of 5.80m-6.80mbgl and 6.00m-6.85mbgl, respectively. Underlying the broken ground, solid ground was recorded to a maximum depth of 10.00mbgl however loss of flush prevented interpretation of the strata.

The presence of broken ground, loss of flush and reduced sample recovery within RBH01 and RBH02 is noted between depths of approximately 5.80m to 6.85m. Given the proximity of recorded coal seams within RBH03, this may be indicative of localised ground disturbance associated with historic coal extraction. However, it is also acknowledged that such features may alternatively be attributable to natural geological variability within the Coal Measures or drilling-related disturbance.

Based on the interpreted depth of weak or disturbed ground, there may be reduced competent rock cover locally; however, this interpretation remains uncertain in the absence of corroborative historical mining records or geophysical survey data.

The depth of the broken ground recorded within RBH01 and RBH02 is consistent with the shallower intact coal seam recorded within RBH03 at depths of between 5.55m and 6.40mbgl, therefore the intact coal seam recorded within RBH03 may represent an undisturbed section of coal measure strata, potentially indicative of variable extraction patterns in the local area. However, insufficient evidence is available to confirm the presence or absence of a defined pillar-and-stall mining layout.

On the above basis, further investigation and/or ground treatment may be required to manage potential risks associated with shallow coal mining legacy, subject to confirmation by additional intrusive investigation/remediation and agreement with the Coal Authority.

Given the shallow nature of the workings beneath the proposed development, it may be possible to dig the area out to the base of the workings and recompact with suitably engineered materials.

Alternatively, a programme of drill and grout stabilisation of the shallow workings should be undertaken in order to stabilise the shallow workings.

Another potential option for the proposed development is for piled foundations or vibro stabilisation taken down through the shallow workings and founding into the underlying competent natural bed rock.

Any stabilisation or treatment of the shallow workings, will require prior approval by the Coal Remediation Authority.

5.0 GEOTECHNICAL ASSESSMENT

5.1 LABORATORY TESTING

A summary of the laboratory findings is shown below.

Determinand	Pennine Lower Coal Measures Formation
Moisture Content %	17.3 – 30.6
Liquid Limit %	43 - 54
Plastic Limit %	22 - 25
Plasticity Index %	21 - 30
% passing 0.425mm %	85 - 100
Modified Plasticity Index %	21.0 – 29.1
pH	4.8 – 6.8
Water Soluble Sulphate	<10 - 29

The geotechnical laboratory testing has revealed that the Pennine Lower Coal Measures have a medium volume change potential. Based on the measured plasticity indices and inferred volume change potential of the superficial deposits, a minimum founding depth of approximately 0.90m below ground level is considered appropriate as a general precautionary measure. Final foundation design should also take account of any ground stabilisation measures required in relation to potential shallow coal workings.

5.2 FOUNDATION DESIGN

It should be noted that any foundation design will be dependent on the type of stabilisation or treatment of the potential shallow workings recorded beneath the site.

Should a programme of drill and grout stabilisation of the shallow workings be undertaken at the site, it is considered that traditional strip foundations, approximately 0.60m wide, bearing on the Pennine Lower Coal Measures Formation, generally comprising firm silty sandy clay, should prove to be a suitable foundation option for the proposed foundations and new building at the site. A net allowable bearing pressure of 100kN/m^2 is considered to be achievable at 0.90mbgl bearing on to cohesive materials of at least firm consistency.

Trees and shrubs of varying type and maturity are present to the immediate south and west of the site. Shallow foundations within close proximity of trees or shrubs are likely to require deepening in accordance to the recorded distances as per NHBC Standards (Building Near Trees Chapter 4.2). Heave protection measures should be adopted in foundation design where appropriate.

Alternatively, it may be possible to dig the area out to the base of the workings and recompact with suitably engineered materials for the proposed foundations.

Another potential option for the proposed development is for piled foundations or vibro stabilisation taken down through the shallow workings and founding into the underlying competent natural bed rock.

It is noted that the requirement for piled foundations is driven primarily by the presence of potential mining-related ground instability rather than solely geotechnical bearing capacity constraints within the natural strata.

5.3 BURIED CONCRETE

Based on the recorded water-soluble sulphate concentrations and pH values it is considered appropriate to adopt a Basic Design Sulphate Class of DS-1, together with an Aggressive Chemical Environment Concrete (ACEC) of AC-3z for the site.

5.4 EXCAVATION & GROUNDWATER CONDITIONS

Excavation of the materials encountered during the ground investigation should be easily achieved using conventional hydraulic excavation techniques.

Soft cohesive deposits were encountered at shallow depth across the site therefore, excavations may require temporary shoring to prevent collapse. On no account, should personnel enter unsupported trenches.

6.0 CONTAMINATION ASSESSMENT

Tier 1 Assessment Criteria for human health with regard to contamination within soils have been produced with reference to values published in LQM/CIEH S4UL and DEFRAs C4SLs. The Tier 1 Assessment Criteria are contained in **Appendix D**.

The laboratory analysis results were assessed against the assessment criteria for a residential with produce end use. A SOM of 2.5% has been adopted for the PAH & TPH CWG analysis.

6.1 HUMAN HEALTH

Soil analysis data have been compared against the GAC threshold values for residential with produce end use.

A total of four samples were scheduled for analysis including Heavy Metals, PAHs, TPH CWG and Asbestos Screen. The full laboratory certificate is contained in **Appendix C**.

An assessment of the analysis results for metals and inorganics contained in **Appendix E**, revealed that no contaminants exceed the respective GAC for residential with produce end use.

6.1.1 Hydrocarbon Contamination

Hydrocarbons have been recorded at levels above laboratory limits of detection; however, concentrations were not detected above relevant GACs.

Furthermore, there was no visual or olfactory evidence of hydrocarbon impacted soils.

6.1.2 Asbestos

Asbestos fibres were not detected within the shallow soils. On this basis, no specific remediation measures are considered necessary in relation to asbestos for the proposed development.

6.1.3 Ground Gas

A potential source of ground gas was identified during the initial Phase I assessment however due to the age of the backfill (>100 years old) this was not considered to pose a significant risk.

To accurately determine the risk of ground gas at the site, ground gas monitoring has been undertaken as part of this assessment.

A total of three gas monitoring wells were installed within boreholes BH01, BH02 and BH03.

As no significant source of ground gas was identified as part of the Phase I assessment, an initial total of three gas monitoring visits have been undertaken at the site.

Copies of the gas monitoring results are included in **Appendix E**, for reference.

A maximum carbon dioxide concentration of 2.8% was recorded on 2nd April 2026 while methane has not been recorded at the site.

Flow rates of 0.0l/hr have been recorded on all occasions, therefore a worst-case flow rate of 0.4l/hr has been utilised for the site.

Based on the above an initial GSV for carbon dioxide has been calculated as 0.0112l/hr.

Two of the gas monitoring visits were undertaken at times of very low pressure (less than 1000mb) at pressures of 992mb (10th April 2026) and 989mb (16th April 2026) while the remaining visit was undertaken during a falling pressure tend.

While the maximum carbon dioxide concentration of 2.8% was recorded during a high pressure reading (1005mb), this was recorded during a falling pressure tend and is significantly below BS8485: 2015+A1: 2019 upper limit of 5% carbon dioxide. In addition, gas flow rates at the time of all three visits were negligible and utilising a worst case flow rate of 0.4l/hr is considered very conservative.

On this basis, it is considered the site should be categorised as 'Characteristic Situation 1'. On this basis, gas protection measures will not be required as part of the development.

The classification has been derived in accordance with CIRIA C665 guidance based on measured methane concentrations, carbon dioxide levels, and observed flow rates across the monitoring period.

6.2 CONTROLLED WATERS

Elevated concentrations of contaminants have not been detected within shallow soils at the site. In addition, the natural strata is thought to be practically impermeable.

Subsequently, the risk of potential contaminants becoming mobilised and leaching into groundwater is considered very low.

The risk to controlled water is therefore considered to be very low.

7.0 PHASE II CONCEPTUAL SITE MODEL

7.1 SOURCE-PATHWAY-RECEPTOR

The conceptual site model has been developed in accordance with the source–pathway–receptor framework and considers the proposed residential end use, the results of the Phase II investigation, and the identified geological conditions.

The model distinguishes between confirmed conditions observed during the investigation and interpreted conditions based on ground behaviour.

The site's former use as maintenance barns are considered to pose a low risk of contamination. In addition, a backfilled pond was present to the immediate west of the site.

Elevated concentrations of contaminants have not been recorded within shallow soils at the site.

In addition, elevated concentrations of carbon dioxide and methane have not been recorded at the site therefore gas protection measures are not required.

Pathways for the end user of the site include direct contact (dermal) with contaminated soil dust; ingestion and inhalation of contaminated soil dust; ingestion of vegetables or soil attached to vegetables which have taken up the contamination and fibres; and inhalation of fibres.

The primary receptors for the site are construction workers and end users of the site (residents).

Remedial measures are not considered necessary to protect the end user.

For the controlled waters environment, the primary receptor is the Secondary A Aquifer underlying the site.

The risk to controlled waters is considered to be very low.

The primary pathway for controlled waters is the leaching and vertical migration of potential contaminants through the vadose zone to the saturated zone.

The development of the conceptual model is illustrated in Figure 8.1.

Figure 7.1: Phase II Conceptual Site Model

HUMAN HEALTH			
Source	**Pathway**	**Receptor**	**Level of Risk/Recommended Action**
Elevated concentrations of contaminants not recorded within the shallow soils. Elevated concentrations of carbon dioxide and methane have not been recorded at the site.	Indoor and outdoor inhalation of soil dust, the ingestion of, and dermal contact with, contaminated soil and soil dust, ingestion of vegetables that have taken up contamination and contaminated soil attached to vegetables.	End users.	No further action required based on current conceptual understanding and investigation data.
		Construction workers.	
	Inhalation of ground gas (Carbon Dioxide and Methane).	End users.	No further action required based on current conceptual understanding and investigation data.
	Water pipes.	End users.	Very low risk – standard pipe likely to be suitable at the site. This should be confirmed with the utility provider.

CONTROLLED WATERS			
Elevated concentrations of contaminants not recorded within the shallow soils.	Leaching of contaminants and vertical migration to the groundwater.	Secondary A Aquifer (Pennine Lower Coal Measures)	No further action required.

8.0 RISK MANAGEMENT & REMEDIATION

Previous sections have quantified the risk posed to identified receptors, which in some instances, require remediation to protect or reduce levels of risk. The following section details measures and recommendations for dealing with risks associated with soil and ground gas contamination in respect to the development proposal for a residential with produce end use.

8.1 REMEDIATION TO PROTECT END USERS

No remediation is required to protect this receptor.

An assessment of the gas monitoring results indicates the site should be categorised as Characteristic Situation 1 and therefore gas protection measures are not required at the site.

Selection of suitable water supply pipes, to be confirmed by the utilities provider.

8.2 REMEDIATION TO PROTECT CONTROLLED WATERS

No remediation is required to protect this receptor.

8.3 REMEDIATION TO PROTECT CONSTRUCTION WORKERS

Significant risk to construction workers is not anticipated. However, basic PPE for all workers (overalls, gloves and dust masks if required) and wash facilities/personal hygiene should be provided as a precautionary measure.

8.4 WASTE MANAGEMENT

A full waste assessment, in accordance with EA WM3 should be undertaken for any waste materials which may involve additional testing including WAC testing.

9.0 RECOMMENDATIONS

Recommendations for further assessment of the site include:

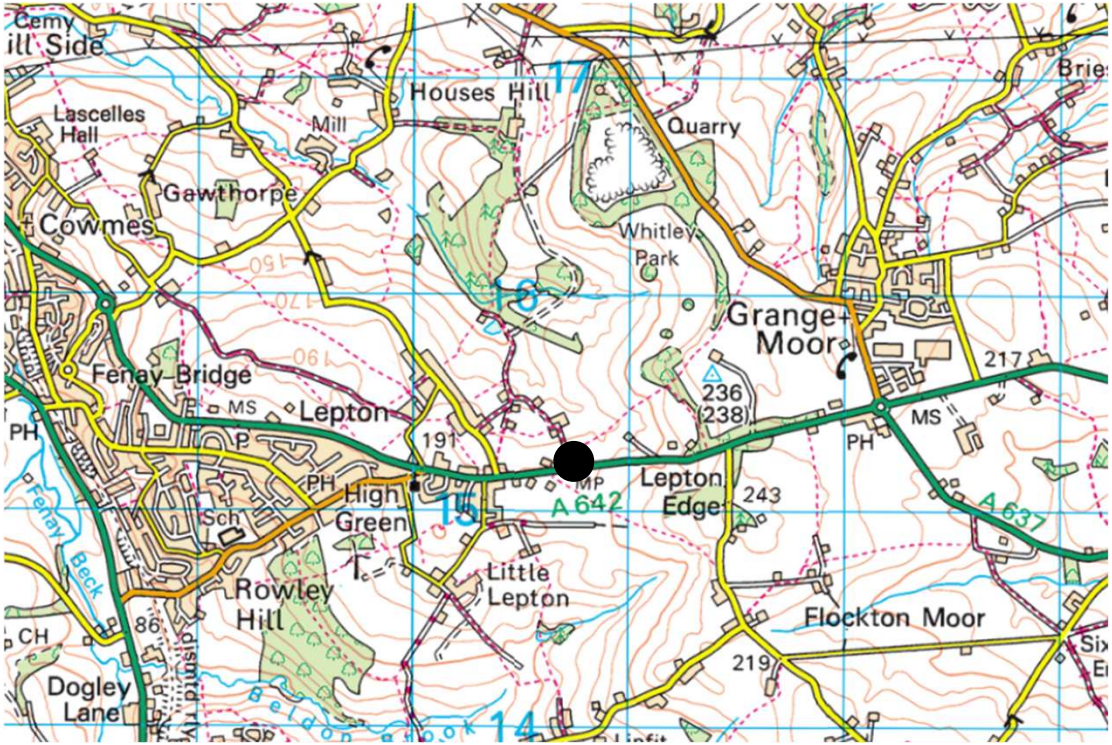
- Remedial measures are not considered necessary based on the current development proposal.
- Should any signs of organic contamination (solvents/oils/fuels) be evident during construction activities, a qualified environmental specialist should be consulted to assess the risk posed to end users and the environment.
- Further assessment or remediation of potential shallow coal mining features is recommended.

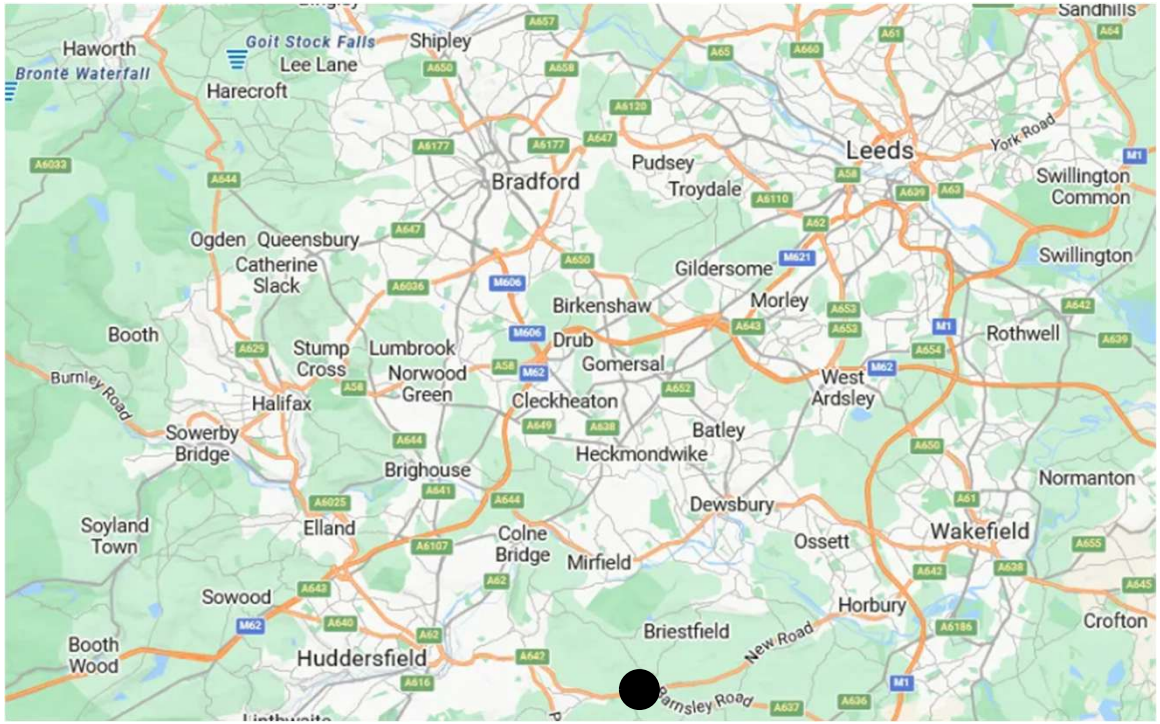
10.0 CONCLUSIONS

This Phase II geo-environmental assessment has illustrated that the proposed development of the site to a residential with produce end use does not indicate a significant risk to end users or the environment based on the available data; however, uncertainty remains in relation to potential shallow mining features which will require further assessment or mitigation at detailed design stage.

Appendix A







KEY:

● Approximate Site Location

DO NOT SCALE

Erda Associates ltd

TITLE:

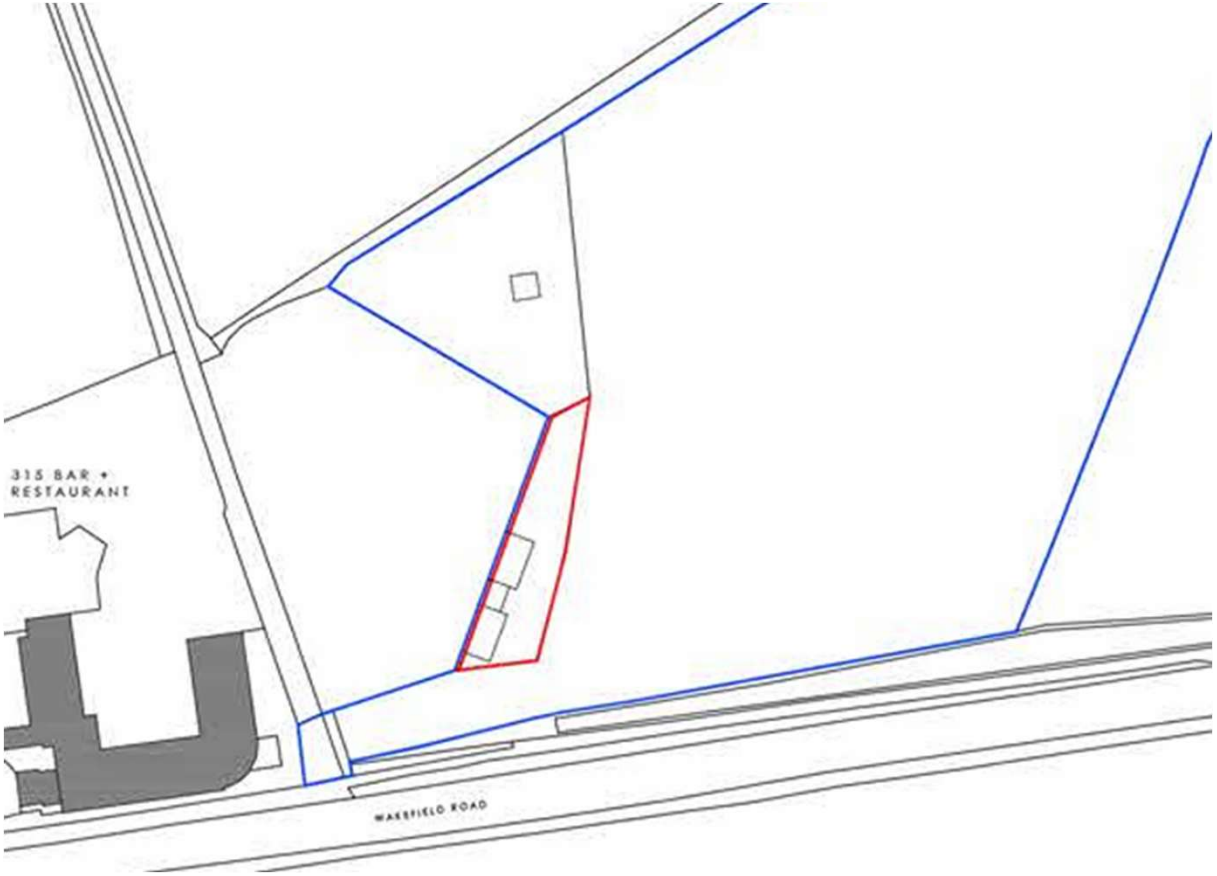
Site Location Plan

PROJECT:

Wakefield Road, Lepton, Huddersfield

PROJECT No:	DATE:
EAL.83.25	05/2026

SCALE :	DRAWN :	DWG No:
NTS	VE	Figure 1



KEY:

Site Boundary

DO NOT SCALE

Verda Associates ltd

TITLE:

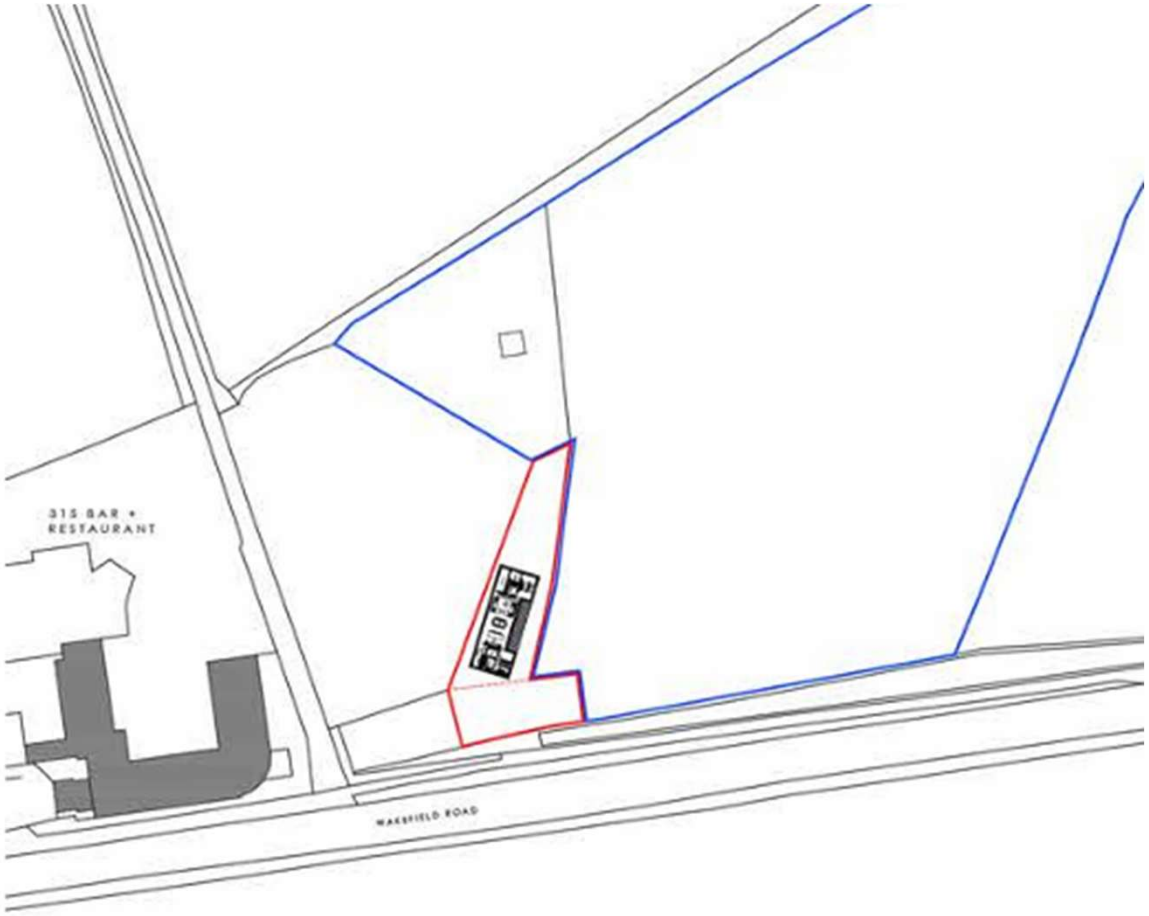
Site Layout

PROJECT:

Wakefield Road, Lepton, Huddersfield

PROJECT No:	DATE:
EAL.83.25	05/2026

SCALE :	DRAWN :	DWG No:
NTS	VE	Figure 2



KEY:

DO NOT SCALE

Verda Associates ltd

TITLE:

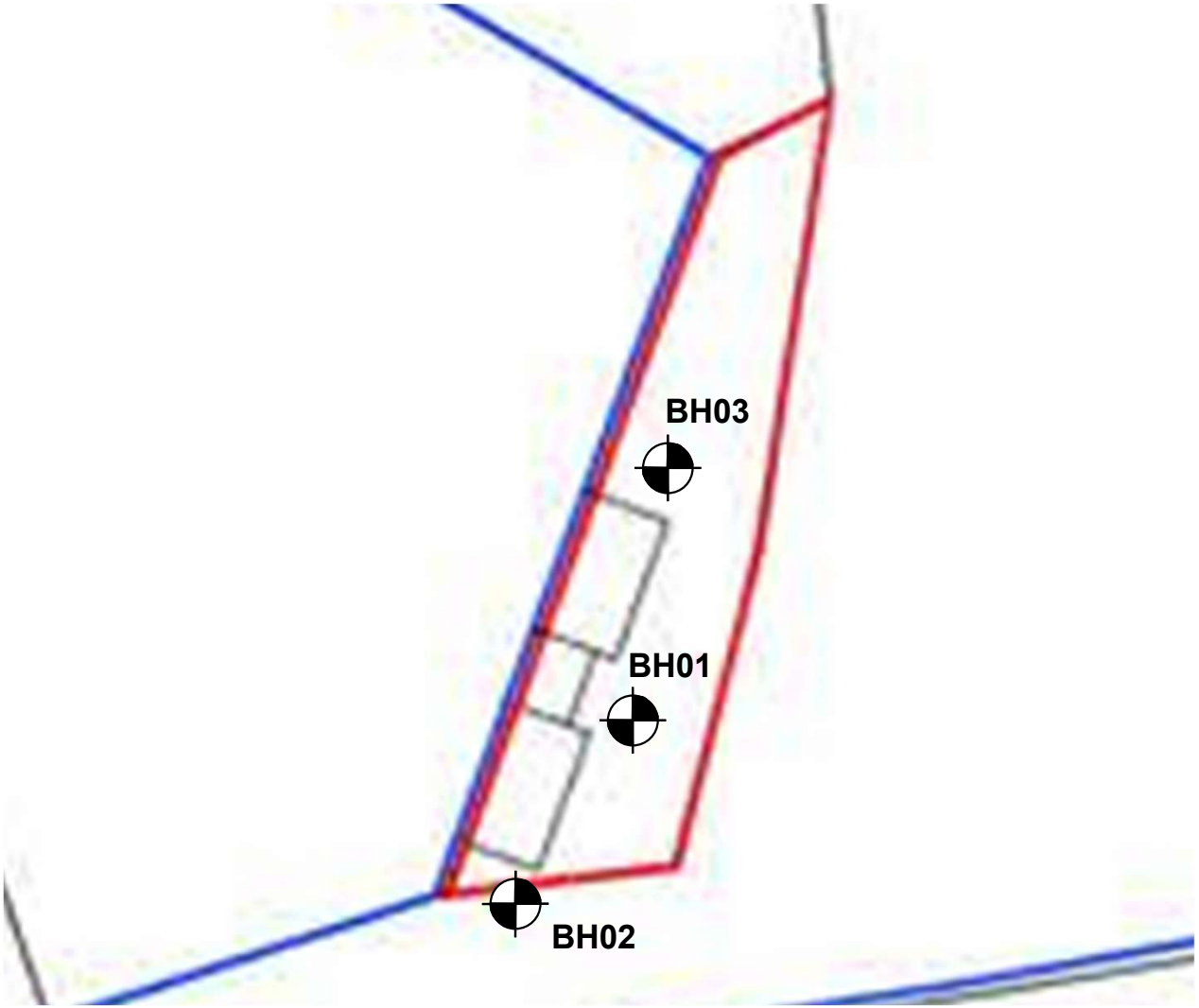
Development Proposal

PROJECT:

Wakefield Road, Lepton, Huddersfield

PROJECT No:	DATE:
EAL.83.25	05/2026

SCALE :	DRAWN :	DWG No:
NTS	VE	Figure 3



KEY:

Window Sample / Rotary Borehole

DO NOT SCALE

Verda Associates ltd

TITLE:

Exploratory Hole Location Plan

PROJECT:

Wakefield Road, Lepton, Huddersfield

PROJECT No:	DATE:
EAL.83.25	05/2026

SCALE :	DRAWN :	DWG No:
NTS	VE	Figure 4

Appendix B

GEO Environmental Engineering

Wakefield Road, Lepton. BH01

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / ROP Samples
0.00	0.20	Grass over topsoil.		
0.20	1.60	Light brown and grey sandy, gravelly CLAY.		
1.60	3.10	Light brown SANDSTONE.		
3.10	5.80	Hard brown and light brown SILTSTONE with sandstone bands.		
5.80	6.80	Loss of flush. Broken Ground with voids.		
6.80	10.00	No returns. No voids or broken ground noted. Solid, steady drilling.		
		Borehole backfilled with bentonite and on completion. Adjacent ws hole installed 1.00m slotted/1.00m plain pipe. No adverse gas detected during or after drilling.		Hand dug before drilling. Cased to 2.50m.

Site: Wakefield road, Lepton, Huddersfield.
Client: Erda
Client Reference:
Driller: GE
Site Works Date: 25/03 and 01/04/26
Plant: Beretta T22 tracked rotary rig with water flush. Then Comacchio geo205 rig with air mist and hammer drill then water flush.

Log Notes:
ROP = Rate of penetration (rotary drilling)
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

Website: www.geoenvironmentalengineering.com
Email: info@geoenvironmentalengineering.com
Telephone: 08456 768 895 / 07883 440 186

GEO Environmental Engineering

Wakefield Road, Lepton. BH02

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / ROP Samples
0.00	0.19	Grass over topsoil.		
0.20	1.60	Light brown and grey sandy, gravelly CLAY.		
1.60	2.20	Light brown SANDSTONE.		
2.20	4.30	Hard brown and light brown SILTSTONE with sandstone bands.		
4.30	6.00	Dark brown and brown MUDSTONE with harder bands.		
6.00	6.85	Loss of flush. Broken Ground with voids.		
6.85	10.00	No returns. No voids or broken ground noted. Solid, steady drilling.		
		Borehole backfilled with bentonite and on completion and installed 6.00m slotted/1.00m plain pipe. No adverse gas detected during or after drilling.		Hand dug before drilling. Cased to 2.50m.

Site: Wakefield road, Lepton, Huddersfield.
Client: Erda
Client Reference:
Driller: GE
Site Works Date: 02/04/26
Plant: Comacchio geo205 rig with air mist and hammer drill then water flush.

Log Notes:
ROP = Rate of penetration (rotary drilling)
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

GEO Environmental Engineering

Wakefield Road, Lepton. BH03

Depth From (m)	Depth To (m)	Strata Description	Legend	Testing / ROP Samples
0.00	0.25	Grass over topsoil.		
0.25	1.90	Light brown and grey sandy, gravelly CLAY.		1.50-2.50: 8 mins
1.90	3.00	Light brown SANDSTONE.		2.50-4.00: 9 mins
3.00	5.55	Interbedded brown and light brown SILTSTONE with sandstone bands and mudstone.		4.00-5.50: 9 mins 5.50-7.00: 4 mins
5.55	6.40	Black COAL.		
6.40	19.80	Grey MUDSTONE.		7.00-8.50: 7 mins 8.50-10.00: 8 mins 10.00-11.50: 8 mins 11.50-13.00: 7 mins 13.00-14.50: 7 mins 14.50-16.50: 15 mins 16.50-18.50: 14 mins 18.50-20.50: 13 mins
19.80	20.20	Black COAL.		
20.20	30.00	Grey and light grey MUDSTONE.		20.20-22.50: 16 mins 22.50-24.50: 13 mins 24.50-26.50: 10 mins 26.50-28.50: 12 mins 28.50-30.00: 10 mins
		Borehole backfilled with bentonite and on completion. Adjacent ws hole installed 1.00m slotted/1.00m plain pipe. No adverse gas detected during or after drilling.		Hand dug before drilling. Cased to 2.50m.

Site: Wakefield road, Lepton, Huddersfield.
Client: Erda
Client Reference:
Driller: GE
Site Works Date: 01/04/26
Plant: Comacchio geo205 rig with air mist and hammer drill then water flush.

Log Notes:
ROP = Rate of penetration (rotary drilling)
Spt = Standard Penetration test (blows per 300mm n300)
HSV = Hand Shear Vane (result in kN/m^2)
CBR = California Bearing Ratio by Mexe Cone Penetrometer (result as percentage)
LP = Limited Penetration (HSV/CBR)
NP = No penetration (HSV/CBR)
B = Bulk Bag, J = Amber Glass Jar, T = Plastic Tub

Borehole Log

BH01

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
BH				1:15

Project Name	Project No.	Start Date	End Date
Land at Wakefield Road, Lepton	EAL.83.25	2026-03-23	2026-03-23

Client | **Consultant** | **Contractor**

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
		0.20	ES 1.00			(0.30)		TOPSOIL.
		0.50	ES 2.00			0.30 (0.30)		Soft brown clayey SILT with occasional fine subrounded to rounded quartzite.
		0.80	D 3.00			0.60		Firm brown yellow grey mottled orange silty sandy CLAY.
		1.00	SPT(C)	N=34 (5,6/6,7,8,13)				*... frequent sandstone cobbles below 0.80mbgl. (0.80m)*
		1.00	D 4.00					*... becoming stiff below 1.00mbgl. (1.00m)*
						(1.00)		
		1.60	SPT(C)	N=50 for 20mm (25 for 45mm/50 for 20mm)		1.60		*End of Borehole at 1.60m*

0.5 1.0 1.5 2.0 2.5 3.0

Remarks

Method, Plant, Stability, Dimensions

Logger

Checked By: VE **Approved By:** PD

Created using Pebble Geo

Borehole Log

BH02

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
BH				1:15

Project Name	Project No.	Start Date	End Date
Land at Wakefield Road, Lepton	EAL.83.25	2026-03-23	2026-03-23

Client | **Consultant** | **Contractor**

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						(0.30) 0.30		TOPSOIL.
		0.20	ES 1			(0.20) 0.50		TOPSOIL
		0.80	D 2			(0.50) 1.00		Soft orange motled grey silty CLAY.
		1.00	SPT(C)	N=50 for 0mm (3,3)		(0.60) 1.60		Stiff brown orange mottled grey CLAY with fine coal fragments. *... becoming firm below 1.00mbgl. (1.00m)*
		1.50	D 3					
		1.60	SPT(C)	N=50 for 105mm (17,8/26,24 for 30mm)				*End of Borehole at 1.60m*

0.5 1.0 1.5 2.0 2.5 3.0

Remarks

Method, Plant, Stability, Dimensions

Logger

Checked By: VE **Approved By:** PD

Created using Pebble Geo

Borehole Log

BH03

Sheet 1 of 1

Hole Type	Easting	Northing	Ground Level (m)	Scale
BH				1:15

Project Name	Project No.	Start Date	End Date
Land at Wakefield Road, Lepton	EAL.83.25	2026-03-23	2026-03-23

Client | **Consultant** | **Contractor**

Inst/ Backfill	Water Levels	Samples and Tests: Depth (m)	Type/ Ref	Results	Level (m)	Depth (thickness) (m)	Strata: Legend	Description
						0.30 (0.30)		TOPSOIL.
		0.20	ES 1			0.30 (0.20)		Soft brown clayey SILT with occasional fine subrounded to rounded quartzite.
						0.50 (0.50)		Soft yellow orange mottled grey silty sandy CLAY.
								... becoming firm below 0.80mbgl. (0.80m)
		1.00	SPT(C)	N=37 (3,4/4,5,5,23)		1.00		Stiff brown orange mottled grey CLAY with sandstone lithorelics.
		1.00	D 2					*... frequent sandstone lithorelics below 1.00mbgl. (1.00m)*
						(0.90)		
						1.90 (0.10)		Weak yellow SANDSTONE.
		2.00	SPT(C)	N=50 for 20mm (25 for 30mm/50 for 20mm)		2.00		*End of Borehole at 2.00m*
		2.00	D 3					

0.5 1.0 1.5 2.0 2.5 3.0

Remarks

Method, Plant, Stability, Dimensions

Logger

Checked By: VE **Approved By:** PD

Created using Pebble Geo

Appendix C

Analytical Test Report	**E26/04141/ERD/26-12963**	**Tested on Behalf of**
Clients Project Reference	EAL.83.25 Lepton Lane, Huddersfield	Erda Associates Ltd
Clients Order Number	EAL.83.25	102 Scalpcliffe Road
Sample(s) Analysed	7	
Sample(s) received / instructed	25/03/2026 / 25/03/2026	
Sample(s) Tested	25/03/2026 to 02/04/2026	
Report issued	02/04/2026	DE15 9AB
Report issue number	1	

Signed



James Gane
Analytical Services Manager

Notes:

General

This report shall not be reproduced except in full

Please refer to Methodologies page for details pertaining to the analytical methods undertaken.

Samples were supplied by customer, results apply to the samples as received.

Samples will be retained for 14 days after issue of this report with the exception of the asbestos test portion which is held for 6 months unless otherwise requested.

Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.

Uncertainty of measurement values are available on request.

Moisture Content was determined in accordance with CTS method statement MS - CL - Sample Prep, oven dried at <30˚C.

Moisture Content is reported as a percentage of the dry mass of soil, this calculation is in accordance with BS1377, Part 2, 1990, Clause 3.2

Stone Content was determined in accordance with CTS method statement MS - CL - Sample Prep and refers to the percentage of stones retained on a 10mm BS test sieve.

MCERTS Accreditation only covers the SAND, CLAY and LOAM matrices

Please note: Where further analysis is required, samples identified as containing asbestos are screened and tested on an as received basis. No correction is made for moisture content and other than the asbestos test(s) these results are not covered by our accreditation.

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

Deviating Samples

On receipt samples are compared against our sample holding and handling protocols, where any deviations have been noted these are reported on our deviating sample page (if present)

Accreditation Key

U = UKAS Accreditation, M = MCERTS Accreditation, N = Unaccredited, SC = Subcontracted

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analytical Test Results - ENV Analysis Solids

Lab Reference					742134	742135	742136
Client Sample ID					0.2	0.5	0.8
Client Sample Location					BH01	BH01	BH01
Client Sample Type					-	-	-
Client Sample Number					-	-	-
Depth - Top (m)					-	-	-
Depth - Bottom (m)					-	-	-
Date of Sampling					23/03/2026	23/03/2026	23/03/2026
Time of Sampling					-	-	-
Sample Matrix					Clay	Clay	Clay
Determinant	**Code**	**Units**	**LOD**	**Accreditation**			
Arsenic	ICPMETS	mg/kg	10	M	17	< 10	-
Boron (Water Soluble)	WSBORONS	mg/kg	2.5	N	< 2.5	-	-
Cadmium	ICPMETS	mg/kg	0.2	M	0.9	0.7	-
Chromium (Total)	ICPMETS	mg/kg	1	U	6.8	6.0	-
Copper	ICPMETS	mg/kg	2	M	26	15	-
Lead	ICPMETS	mg/kg	1.5	M	56	23	-
Mercury	ICPMETS	mg/kg	2.5	U	< 2.5	< 2.5	-
Nickel	ICPMETS	mg/kg	1	M	17	13	-
Selenium	ICPMETS	mg/kg	8	N	< 8.0	< 8.0	-
Vanadium	ICPMETS	mg/kg	0.5	U	-	23	-
Zinc	ICPMETS	mg/kg	2	M	87	59	-
Total Phenols	SKALARPHS	mg/kg	1	M	< 1.0	-	-
Cyanide (Total)	SKALARCNS	mg/kg	1	M	< 1.0	-	-
Chromium (Hexavalent)	SKALARHCS	mg/kg	1	N	-	< 1.0	-
Acid Soluble Sulphate	ASSO4S	%	0.01	N	-	0.03	-
pH	PHS	pH units	1	M	6.5	6.8	-
Water Soluble Sulphate (as SO4)	ANIONSS	mg/L	10	N	< 10	< 10	-
SOM	TOCS	%	0.86	U	6.6	3.4	-
Asbestos	ASB	p/a	-	U	No Asbestos Detected	No Asbestos Detected	-
Acenaphthene	PAHASRDS	mg/kg	0.02	M	0.03	< 0.02	-
Acenaphthylene	PAHASRDS	mg/kg	0.02	U	0.06	< 0.02	-
Anthracene	PAHASRDS	mg/kg	0.02	U	0.07	< 0.02	-
Benzo[a]anthracene	PAHASRDS	mg/kg	0.02	M	0.29	0.03	-
Benzo[a]pyrene	PAHASRDS	mg/kg	0.02	M	0.31	0.03	-
Benzo[b]fluoranthene	PAHASRDS	mg/kg	0.02	M	0.37	0.05	-
Benzo[ghi]perylene	PAHASRDS	mg/kg	0.02	M	0.18	0.03	-
Benzo[k]fluoranthene	PAHASRDS	mg/kg	0.02	M	0.17	< 0.02	-
Chrysene	PAHASRDS	mg/kg	0.02	M	0.37	0.04	-
Dibenzo[a,h]anthracene	PAHASRDS	mg/kg	0.02	M	0.05	< 0.02	-
Fluoranthene	PAHASRDS	mg/kg	0.02	M	0.94	0.06	-
Fluorene	PAHASRDS	mg/kg	0.02	M	0.07	< 0.02	-
Indeno[1,2,3,-cd]pyrene	PAHASRDS	mg/kg	0.02	M	0.21	0.03	-
Naphthalene	PAHASRDS	mg/kg	0.02	M	0.07	< 0.02	-
Phenanthrene	PAHASRDS	mg/kg	0.02	M	0.88	0.06	-

Date of Issue: 21.01.25
Issued by: J. Gane
Issue No: 1
Rev No: 9

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

4161

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analytical Test Results - ENV Analysis Solids

Lab Reference					742137	742138	742139
Client Sample ID					0.2	0.8	0.2
Client Sample Location					BH02	BH02	BH03
Client Sample Type					-	-	-
Client Sample Number					-	-	-
Depth - Top (m)					-	-	-
Depth - Bottom (m)					-	-	-
Date of Sampling					23/03/2026	23/03/2026	23/03/2026
Time of Sampling					-	-	-
Sample Matrix					Clay	Clay	Clay
Determinant	**Code**	**Units**	**LOD**	**Accreditation**			
Arsenic	ICPMETS	mg/kg	10	M	17	-	15
Boron (Water Soluble)	WSBORONS	mg/kg	2.5	N	< 2.5	-	-
Cadmium	ICPMETS	mg/kg	0.2	M	0.9	-	0.8
Chromium (Total)	ICPMETS	mg/kg	1	U	6.5	-	6.0
Copper	ICPMETS	mg/kg	2	M	27	-	21
Lead	ICPMETS	mg/kg	1.5	M	52	-	45
Mercury	ICPMETS	mg/kg	2.5	U	< 2.5	-	< 2.5
Nickel	ICPMETS	mg/kg	1	M	17	-	13
Selenium	ICPMETS	mg/kg	8	N	< 8.0	-	< 8.0
Vanadium	ICPMETS	mg/kg	0.5	U	-	-	26
Zinc	ICPMETS	mg/kg	2	M	92	-	75
Total Phenols	SKALARPHS	mg/kg	1	M	< 1.0	-	-
Cyanide (Total)	SKALARCNS	mg/kg	1	M	< 1.0	-	-
Chromium (Hexavalent)	SKALARHCS	mg/kg	1	N	-	-	< 3.0
Acid Soluble Sulphate	ASSO4S	%	0.01	N	-	-	0.07
pH	PHS	pH units	1	M	6.8	-	5.4
Water Soluble Sulphate (as SO4)	ANIONSS	mg/L	10	N	< 10	-	12
SOM	TOCS	%	0.86	U	7.4	-	6.2
Asbestos	ASB	p/a	-	U	No Asbestos Detected	-	No Asbestos Detected
Acenaphthene	PAHASRDS	mg/kg	0.02	M	< 0.02	-	< 0.02
Acenaphthylene	PAHASRDS	mg/kg	0.02	U	0.03	-	< 0.02
Anthracene	PAHASRDS	mg/kg	0.02	U	0.08	-	0.05
Benzo[a]anthracene	PAHASRDS	mg/kg	0.02	M	0.29	-	0.22
Benzo[a]pyrene	PAHASRDS	mg/kg	0.02	M	0.28	-	0.21
Benzo[b]fluoranthene	PAHASRDS	mg/kg	0.02	M	0.39	-	0.27
Benzo[ghi]perylene	PAHASRDS	mg/kg	0.02	M	0.19	-	0.14
Benzo[k]fluoranthene	PAHASRDS	mg/kg	0.02	M	0.15	-	0.12
Chrysene	PAHASRDS	mg/kg	0.02	M	0.33	-	0.23
Dibenzo[a,h]anthracene	PAHASRDS	mg/kg	0.02	M	0.06	-	0.04
Fluoranthene	PAHASRDS	mg/kg	0.02	M	0.62	-	0.46
Fluorene	PAHASRDS	mg/kg	0.02	M	< 0.02	-	< 0.02
Indeno[1,2,3,-cd]pyrene	PAHASRDS	mg/kg	0.02	M	0.21	-	0.16
Naphthalene	PAHASRDS	mg/kg	0.02	M	0.08	-	0.08
Phenanthrene	PAHASRDS	mg/kg	0.02	M	0.41	-	0.30

Date of Issue: 21.01.25
Issued by: J. Gane
Issue No: 1
Rev No: 9

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

UKAS TESTING
4161

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analytical Test Results - ENV Analysis Solids

Lab Reference					742140
Client Sample ID					1
Client Sample Location					BH03
Client Sample Type					-
Client Sample Number					-
Depth - Top (m)					-
Depth - Bottom (m)					-
Date of Sampling					23/03/2026
Time of Sampling					-
Sample Matrix					Clay
Determinant	**Code**	**Units**	**LOD**	**Accreditation**	
Arsenic	ICPMETS	mg/kg	10	M	-
Boron (Water Soluble)	WSBORONS	mg/kg	2.5	N	-
Cadmium	ICPMETS	mg/kg	0.2	M	-
Chromium (Total)	ICPMETS	mg/kg	1	U	-
Copper	ICPMETS	mg/kg	2	M	-
Lead	ICPMETS	mg/kg	1.5	M	-
Mercury	ICPMETS	mg/kg	2.5	U	-
Nickel	ICPMETS	mg/kg	1	M	-
Selenium	ICPMETS	mg/kg	8	N	-
Vanadium	ICPMETS	mg/kg	0.5	U	-
Zinc	ICPMETS	mg/kg	2	M	-
Total Phenols	SKALARPHS	mg/kg	1	M	-
Cyanide (Total)	SKALARCNS	mg/kg	1	M	-
Chromium (Hexavalent)	SKALARHCS	mg/kg	1	N	-
Acid Soluble Sulphate	ASSO4S	%	0.01	N	-
pH	PHS	pH units	1	M	-
Water Soluble Sulphate (as SO4)	ANIONSS	mg/L	10	N	-
SOM	TOCS	%	0.86	U	-
Asbestos	ASB	p/a	-	U	-
Acenaphthene	PAHASRDS	mg/kg	0.02	M	-
Acenaphthylene	PAHASRDS	mg/kg	0.02	U	-
Anthracene	PAHASRDS	mg/kg	0.02	U	-
Benzo[a]anthracene	PAHASRDS	mg/kg	0.02	M	-
Benzo[a]pyrene	PAHASRDS	mg/kg	0.02	M	-
Benzo[b]fluoranthene	PAHASRDS	mg/kg	0.02	M	-
Benzo[ghi]perylene	PAHASRDS	mg/kg	0.02	M	-
Benzo[k]fluoranthene	PAHASRDS	mg/kg	0.02	M	-
Chrysene	PAHASRDS	mg/kg	0.02	M	-
Dibenzo[a,h]anthracene	PAHASRDS	mg/kg	0.02	M	-
Fluoranthene	PAHASRDS	mg/kg	0.02	M	-
Fluorene	PAHASRDS	mg/kg	0.02	M	-
Indeno[1,2,3,-cd]pyrene	PAHASRDS	mg/kg	0.02	M	-
Naphthalene	PAHASRDS	mg/kg	0.02	M	-
Phenanthrene	PAHASRDS	mg/kg	0.02	M	-

Date of Issue: 21.01.25
Issued by: J. Gane
Issue No: 1
Rev No: 9

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

UKAS TESTING
4161
mCERTS

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analytical Test Results - ENV Analysis Solids

Lab Reference					742134	742135	742136
Client Sample ID					0.2	0.5	0.8
Client Sample Location					BH01	BH01	BH01
Client Sample Type					-	-	-
Client Sample Number					-	-	-
Depth - Top (m)					-	-	-
Depth - Bottom (m)					-	-	-
Date of Sampling					23/03/2026	23/03/2026	23/03/2026
Time of Sampling					-	-	-
Sample Matrix					Clay	Clay	Clay
Determinant	**Code**	**Units**	**LOD**	**Accreditation**			
Pyrene	PAHASRDS	mg/kg	0.02	M	0.73	0.06	-
Total PAH (Sum of USEPA 16)	PAHASRDS	mg/kg	0.32	U	4.8	0.55	-
Water Soluble Sulphate (as SO4)	ANIONSSBRE	mg/L	10	N	-	-	< 10
pH	PHSBRE	pH units	1	M	-	-	6.1

Date of Issue: 21.01.25
Issued by: J. Gane
Issue No: 1
Rev No: 9

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

4161

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analytical Test Results - ENV Analysis Solids

Lab Reference					742137	742138	742139
Client Sample ID					0.2	0.8	0.2
Client Sample Location					BH02	BH02	BH03
Client Sample Type					-	-	-
Client Sample Number					-	-	-
Depth - Top (m)					-	-	-
Depth - Bottom (m)					-	-	-
Date of Sampling					23/03/2026	23/03/2026	23/03/2026
Time of Sampling					-	-	-
Sample Matrix					Clay	Clay	Clay
Determinant	**Code**	**Units**	**LOD**	**Accreditation**			
Pyrene	PAHASRDS	mg/kg	0.02	M	0.52	-	0.40
Total PAH (Sum of USEPA 16)	PAHASRDS	mg/kg	0.32	U	3.7	-	2.7
Water Soluble Sulphate (as SO4)	ANIONSSBRE	mg/L	10	N	-	< 10	-
pH	PHSBRE	pH units	1	M	-	6.6	-

Date of Issue: 21.01.25
Issued by: J. Gane
Issue No: 1
Rev No: 9

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

4161

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analytical Test Results - ENV Analysis Solids

Lab Reference					**742140**
Client Sample ID					1
Client Sample Location					BH03
Client Sample Type					-
Client Sample Number					-
Depth - Top (m)					-
Depth - Bottom (m)					-
Date of Sampling					23/03/2026
Time of Sampling					-
Sample Matrix					Clay
Determinant	**Code**	**Units**	**LOD**	**Accreditation**	
Pyrene	PAHASRDS	mg/kg	0.02	M	-
Total PAH (Sum of USEPA 16)	PAHASRDS	mg/kg	0.32	U	-
Water Soluble Sulphate (as SO4)	ANIONSSBRE	mg/L	10	N	29
pH	PHSBRE	pH units	1	M	4.8

Date of Issue: 21.01.25
Issued by: J. Gane
Issue No: 1
Rev No: 9

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

4161

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analytical Test Results - EPHVPHS

Lab Reference					742134	742137
Client Sample ID					0.2	0.2
Client Sample Location					BH01	BH02
Client Sample Type					-	-
Client Sample Number					-	-
Depth - Top (m)					-	-
Depth - Bottom (m)					-	-
Date of Sampling					23/03/2026	23/03/2026
Time of Sampling					-	-
Sample Matrix					Clay	Clay
Determinant	**Code**	**Units**	**LOD**	**Accreditation**		
Benzene	VPHS	mg/kg	0.01	M	< 0.01	< 0.01
Toluene	VPHS	mg/kg	0.01	M	< 0.01	< 0.01
Ethylbenzene	VPHS	mg/kg	0.01	M	< 0.01	< 0.01
m&p Xylene	VPHS	mg/kg	0.02	M	< 0.02	< 0.02
o-Xylene	VPHS	mg/kg	0.01	M	< 0.01	< 0.01
Methyl tert-butyl ether (MTBE)	VPHS	mg/kg	0.01	M	< 0.01	< 0.01
Aliphatic >C5 to C6 [5]	VPHS	mg/kg	0.06	M	< 0.06	< 0.06
Aliphatic >C6 to C8 [5]	VPHS	mg/kg	0.06	M	< 0.06	< 0.06
Aliphatic >C8 to C10 [5]	VPHS	mg/kg	0.06	M	< 0.06	< 0.06
Aliphatic >C10-C12 [13]	GCXGCS	mg/kg	1	M	< 1.0	< 1.0
Aliphatic >C12-C16 [13]	GCXGCS	mg/kg	1	M	2.2	3.5
Aliphatic >C16-C21 [13]	GCXGCS	mg/kg	1	M	3.9	5.6
Aliphatic >C21-C35 [13]	GCXGCS	mg/kg	2	M	11	14
Aliphatic >C35-C44 [13]	GCXGCS	mg/kg	5	N	< 5.0	< 5.0
Aromatic >C5 to C7 [6]	VPHS	mg/kg	0.01	M	< 0.01	< 0.01
Aromatic >C7 to C8 [6]	VPHS	mg/kg	0.01	M	< 0.01	< 0.01
Aromatic >C8 to C10 [6]	VPHS	mg/kg	0.06	M	< 0.06	< 0.06
Aromatic >C10-C12 [14]	GCXGCS	mg/kg	1	M	< 1.0	< 1.0
Aromatic >C12-C16 [14]	GCXGCS	mg/kg	1	M	< 1.0	< 1.0
Aromatic >C16-C21 [14]	GCXGCS	mg/kg	1	M	9.1	8.6
Aromatic >C21-C35 [14]	GCXGCS	mg/kg	2	M	9.4	36
Aromatic >C35-C44 [14]	GCXGCS	mg/kg	5	N	< 5.0	9.9
Total >C5-C35 (Ali/Aro) [10]	CWGS	mg/kg	10	M	36	67

Date of Issue: 21.01.25
Issued by: J. Gane
Issue No: 1
Rev No: 9

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

4161

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Sample Descriptions

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Description	Moisture Content (%)	Stone Content (%)	Passing 2mm test sieve (%)
742134	0	BH01	SOIL	-	Dark brown sandy gravelly silty clay with rare organic matter	32	< 0.1	70
742135	1	BH01	SOIL	-	Dark brown sandy gravelly silty clay with rare organic matter	26	< 0.1	72
742136	1	BH01	SOIL	-	Brown sandy gravelly silty clay with rare organic matter	-	-	67
742137	0.2	BH02	SOIL	-	Dark brown sandy gravelly silty clay with rare organic matter	38	< 0.1	87
742138	0.8	BH02	SOIL	-	Brown silty clay with rare organic matter	-	-	100
742139	0.2	BH03	SOIL	-	Dark brown sandy gravelly silty clay with rare organic matter	30	< 0.1	90
742140	1	BH03	SOIL	-	Brown sandy gravelly silty clay with rare organic matter	-	-	100

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Sample Comments

Lab Reference	Client Sample ID	Client Sample Location	Client Sample Type	Client Sample Number	Comments
742139	0	BH03	SOIL	-	Chromium(Hexavalent) - Reporting limit raised due to sample matrix interference.

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

Analysis Methodologies - Please refer to sample comments page (if present) for any changes to methods Methods

Test Code	Test Name / Reference	Sample condition for analysis	Sample Preparation	Test Details
ANIONSS	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
ANIONSSBRE	MS - CL - Anions by Aquakem (2:1Extract)	Oven dried	Passing 2mm test sieve	Determination of Anions (inc Sulphate, chloride etc.) in soils by Aquakem. Analysis is based on a 2:1 water to soil extraction ratio
ASB	MS - AS - Asbestos	-	-	Fibre identification is in accordance with in house documented methods which are based on the procedure documented in the HSE Document HSG 248 "Asbestos: The analysts guide for sampling, analysis and clearance procedures"
ASSO4S	MS - CL - Acid Soluble Sulphate	Oven Dried	Passing 2mm test sieve	Determination of total sulphate in soils by acid extraction followed by ICP analysis
CWGS	Calculation from VPH-S and EPH-S	As received	Passing 10mm test sieve	Determination of TPH CWG (Volatile Petroleum Hydrocarbons and Extractable Petroleum Hydrocarbons) in soils via Headspace-GC-MS and GC-GC-FID respectively
GCXGCS	MS - CL - TPH & EPH by GCXGC	As received	Passing 10mm test sieve	Determination of TPH and EPH in soils via GCxGC-FID
ICPMETS	MS - CL - ICP Metals	Air dried	Passing 10mm test sieve	Determination of metals in soils via ICP
PAHASRDS	MS - CL - PAH (As Received)	As received	Passing 10mm test sieve	Determination of Polyaromatic hydrocarbons in soil via GC-MS
PHS	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
PHSBRE	MS - CL - pH in Soils	As received	Passing 10mm test sieve	Determination of pH in soils using a pH probe (using a 1:3 soil to water extraction)
SAMPLEPREP	MS - CL - Sample Preparation	-	-	Preparation of samples (including determination of moisture content) to allow for subsequent analysis
SKALARCNS	MS - CL - Cyanide by Skalar	As received	Passing 10mm test sieve	Determination of cyanide (total / free / complex) in soil using a Skalar segmented flow analyser
SKALARHCS	MS - CL - Hexavalent Chromium by Skalar	As received	Passing 10mm test sieve	Determination of hexavalent chromium in soil using Skalar segmented flow analyser
SKALARPHS	MS - CL - Phenols by Skalar	As received	Passing 10mm test sieve	Determination of total phenols in soil using Skalar segmented flow analyser
TOCS	MS - CL - TOC Eltra	Air Dried	Passing 10mm test sieve	Determination of Total Organic Carbon in soils
VPHS	MS - CL - VPH	As received	Passing 10mm test sieve	Determination of VPH in soils via Headspace-GC-MS
WSBORONS	MS - CL - WS Boron	Air dried	Passing 10mm test sieve	Determination of Water soluble Boron in soils via ICP

E26/04141/ERD/26-12963

EAL.83.25 Lepton Lane, Huddersfield

HWOL TPH Acronym Index

Acronym	Description
HS	Headspace Analysis
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent
CU	Clean-up e.g. by florisil, silica gel
1D	GC - Single coil gas chromatography
Total	Aliphatics and Aromatics
AL	Aliphatics Only
AR	Aromatics Only
2D	GC-GC - Double Coil Gas Chromatography
#1	EH_Total but with humics mathematically subtracted
#2	EH_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (except for +)
+	Operator to indicate cumlative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry

Key of Codes	
[1]	EH_1D_TOTAL
[2]	EH_CU_1D_TOTAL
[3]	EH_CU+HS_1D_TOTAL
[4]	EH_1D+HS_MS_TOTAL
[5]	HS_MS_1D_AL
[6]	HS_MS_1D_AR
[7]	HS_MS_1D_TOTAL
[8]	EH_CU_1D_AL
[9]	EH_CU_1D_AR
[10]	EH_2D+HS_1D_TOTAL
[11]	EH_CU_2D+HS_1D_TOTAL
[12]	EH_2D_TOTAL
[13]	EH_2D_AL
[14]	EH_2D_AR
[15]	EH_CU_2D_TOTAL
[16]	EH_CU_2D_AL
[17]	EH_CU_2D_AR

Testing performed at
7-11 Harding Street, Leicester, LE1 4DH

4161

LABORATORY REPORT

Contract Number: PSL26/3003

Report Date: 15 April 2026

Client's Reference: EAL.83.25

Client Name: Erda Associates Ltd
102 Scalpcliffe Road
Burton Upon Trent
DE15 9AB

For the attention of: Vicky Evans

Contract Title: Lepton Lane, Huddersfield

Date Received: 08/04/2026
Date Commenced: 08/04/2026
Date Completed: 15/04/2026

Notes: Opinions and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced other than in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

A Watkins (Managing Director)	R Berriman (Associate Director)	S Royle (Laboratory Manager)
L Knight (Assistant Laboratory Manager)	S Eyre (Senior Technician)	D Nicholson (Senior Technician)

5 – 7 Hexthorpe Road,
Hexthorpe,
Doncaster,
DN4 0AR
Tel: 01302 768098
Email: rberriman@prosoils.co.uk
awatkins@prosoils.co.uk

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Description of Sample
BH01	4	D	1.00		Brown slightly sandy slightly gravelly CLAY.
BH02	3	D	1.50		Brown mottled grey slightly sandy slightly gravelly CLAY.
BH03	3	D	2.00		Brown mottled grey slightly sandy CLAY.

UKAS TESTING 4043

PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Lepton Lane, Huddersfield

Contract No:

PSL26/3003

Client Ref:

EAL.83.25

SUMMARY OF SOIL CLASSIFICATION TESTS

BS 1377 - Part 2 : 2022 in accordance with BS EN ISO 17892 (as below)

Hole Number	Sample Number	Sample Type	Top Depth m	Base Depth m	Water Content %	Linear Shrinkage	Particle Density Mg/m^3	Liquid Limit %	Plastic Limit %	Plasticity Index %	Passing 0.425mm %	Remarks
BH01	4	D	1.00		30.6			54	24	30	97	High Plasticity CIH
BH02	3	D	1.50		19.8			52	25	27	85	High Plasticity CIH
BH03	3	D	2.00		17.3			43	22	21	100	Medium Plasticity CIM

Water Content - BS 1377 - Part 2 : 2022 : Clause 4 in accordance with BS EN ISO 17892 - 1 : 2014 + A1 : 2022
Linear Shrinkage - BS 1377 - Part 2 : 2022 : Clause 7
Particle Density (Gas Jar method) - BS 1377 - Part 2 : 2022 : Clause 9
Liquid, Plastic Limit & Plasticity Index - BS 1377 - Part 2 : 2022 : Clause 5 & 6 in accordance with BS EN ISO 17892 - 12 : 2018 + A2 : 2022

SYMBOLS : NP = Non Plastic

UKAS TESTING 4043

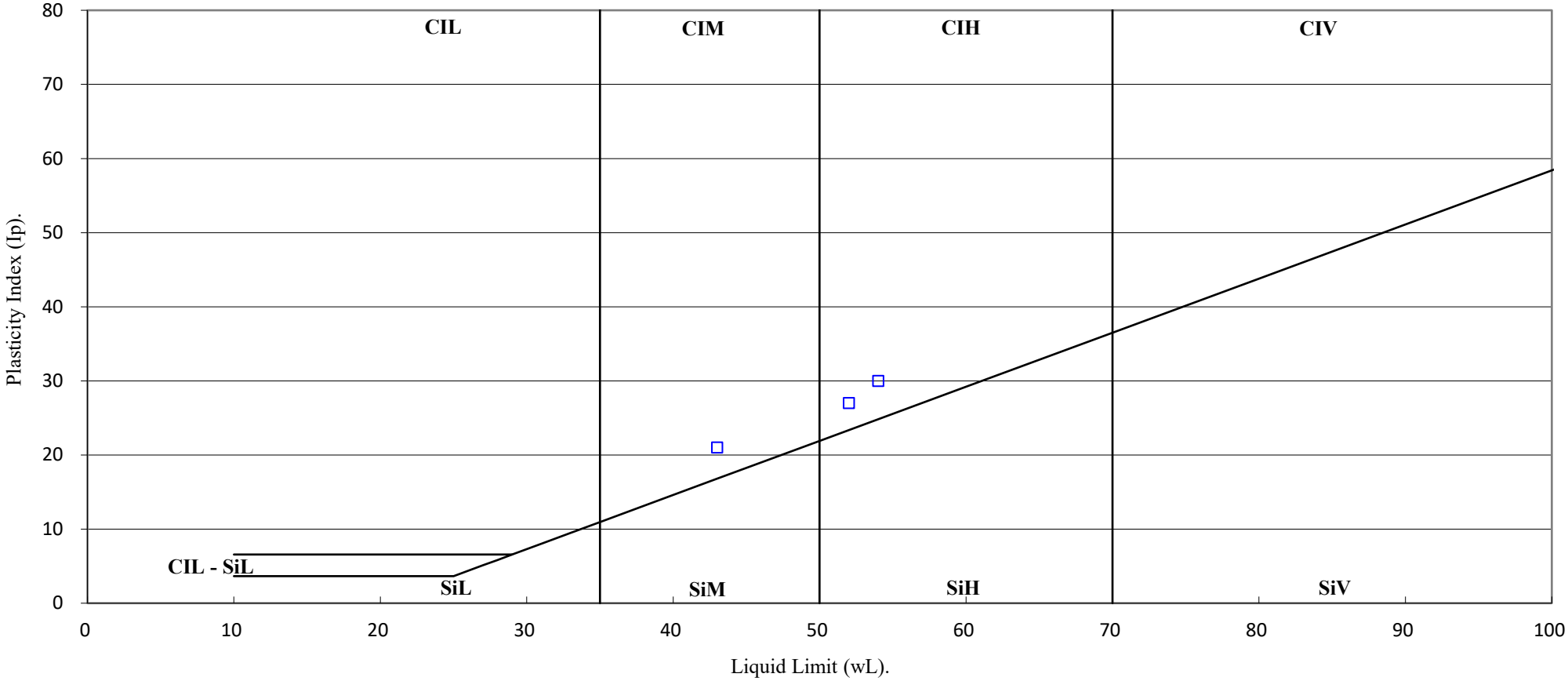
PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY

Lepton Lane, Huddersfield

Contract No:
PSL26/3003
Client Ref:
EAL.83.25

PLASTICITY CHART

BS EN ISO 14688-2:2017 Clause 4.4



UKAS TESTING 4043 / PSL PROFESSIONAL SOILS LABORATORY A PHENNA GROUP COMPANY	**Lepton Lane, Huddersfield**	**Contract No:**
		PSL26/3003
		Client Ref:
		EAL.83.25

Appendix D

Tier 1 Assessment Criteria

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

Note:

All figures are copyright Land Quality Management Limited, reporduced with permission; Publication Number S4UL3852. All rights reserved.

* Values calculated using CLEA v1.071

Tier 1 Assessment Criteria

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

Note:

All figures are copyright Land Quality Management Limited, reporduced with permission; Publication Number S4UL3852. All rights reserved.

[VAP] - S4UL presented exceed the vapour saturation limit, which is presented in brackets.

[sol] - S4UL presented exceeds the solubility saturation limit, which is presented in brackets.

Appendix E

Erda Associates ltd

Web: www.erda-ltd.co.uk
Email: p.devitt@erda-ltd.co.uk
Phone: 07531 051197

GROUNDWATER / GAS MONITORING RECORD SHEET

Client:	John Froud	**Job No:**	EAL.83.25	**Instruments Used:**	GFM436
Project:	Wakefield Road, Lepton	**Date:**	2nd April 2026	**Monitored By:**	V Evans
Weather:	Mild/cloudy			**Pressure Trend:**	Falling

Installation No.	Peak[1]		Steady[2]				Total gas flow rate	Atmospheric Pressure	Water Depth	Base Depth	Remarks
	CH_4 (% vol)	CO_2 (% vol)	CH_4 (% vol)	LEL (%)	CO_2 (% vol)	O_2 (% vol)	(l/hr)	(mbar)	(mbgl)	(m bgl)	
BH01	0.0	0.5	0.0	0.0	0.5	20.0	0.4	1005	Dry	2.00	
BH02	0.0	2.8	0.0	0.0	2.8	17.0	0.2	1005	Dry	7.00	
BH03	0.0	0.1	0.0	0.0	0.1	20.5	0.3	1005	Dry	2.00	

[1] The peak reading is the maximum recorded level during a monitoring event.
[2] The steady reading is the level which remained constant after approximately 2 minutes.

Erda Associates ltd

Web: www.erda-ltd.co.uk
Email: p.devitt@erda-ltd.co.uk
Phone: 07531 051197

GROUNDWATER / GAS MONITORING RECORD SHEET

Client:	John Froud	**Job No:**	EAL.83.25	**Instruments Used:**	GFM436		
Project:	Wakefield Road, Lepton	**Date:**	10th April 2026	**Monitored By:**	V Evans		
Weather:	Mild/cloudy.			**Pressure Trend:**	Rising		

Installation No.	Peak[1]		Steady[2]				Total gas flow rate	Atmospheric Pressure	Water Depth	Base Depth	Remarks
	CH_4 (% vol)	CO_2 (% vol)	CH_4 (% vol)	LEL (%)	CO_2 (% vol)	O_2 (% vol)	(l/hr)	(mbar)	(mbgl)	(m bgl)	
BH01	0.0	2.0	0.0	0.0	2.0	13.5	0.0	992	Dry	2.00	
BH02	0.0	0.8	0.0	0.0	0.8	14.0	0.0	992	Dry	7.00	
BH03	0.0	2.2	0.0	0.0	2.2	12.7	0.0	992	Dry	2.00	

[1] The peak reading is the maximum recorded level during a monitoring event.
[2] The steady reading is the level which remained constant after approximately 2 minutes.

Erda Associates ltd

Web: www.erda-ltd.co.uk
Email: p.devitt@erda-ltd.co.uk
Phone: 07531 051197

GROUNDWATER / GAS MONITORING RECORD SHEET

Client:	John Froud	**Job No:**	EAL.83.25	**Instruments Used:**	GFM436
Project:	Wakefield Road, Lepton	**Date:**	16th April 2026	**Monitored By:**	V Evans
Weather:	Mild/sunny.			**Pressure Trend:**	Rising

Installation No.	Peak[1]		Steady[2]				Total gas flow rate	Atmospheric Pressure	Water Depth	Base Depth	Remarks
	CH_4 (% vol)	CO_2 (% vol)	CH_4 (% vol)	LEL (%)	CO_2 (% vol)	O_2 (% vol)	(l/hr)	(mbar)	(mbgl)	(m bgl)	
BH01	0.0	1.0	0.0	0.0	1.0	14.4	0.0	989	Dry	2.00	
BH02	0.0	1.2	0.0	0.0	1.2	13.7	0.0	989	Dry	7.00	
BH03	0.0	0.9	0.0	0.0	0.9	14.6	0.0	989	Dry	2.00	

[1] The peak reading is the maximum recorded level during a monitoring event.
[2] The steady reading is the level which remained constant after approximately 2 minutes.