

Rotary Drilling Report

LOCATION	Slip-In Farm, Bacup, Lancashire OL13 8NL
ISSUE DATE	January 2024
FOR	Nick Graham
CLIENT REF.	
OUR REF.	G23401

Prepared by



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1. Introduction

In accordance with your instruction, Geoinvestigate Limited carried out a coal drilling investigation at Slip Inn Farm, Bacup, Lancashire OL13 8NL.

It is proposed to erect a new agricultural steel-clad farm building/storage unit at the property.

Geoinvestigate's previous Coal Mining Risk Assessment (CMRA, G22267, July 2022), identified recorded workings within the Lower Mountain seam 13m below the property. The seam has a recorded extraction depth of 900mm.

The purpose of the drilling investigation was to establish if the new building is at risk from surface ground instability arising from historical mine-workings by establishing bedrock depth and any seam / working thickness.

2. Scope of Investigation

The following scope of investigation was carried out:

- Sinking of two (2) rotary open hole boreholes (RH1 & RH2) to depths of 30.00m to probe for shallow mine-workings. The boreholes were driven by Geoinvestigate's proprietary Microdrill® system using small volume water flush. The works were carried out under CA permit 27612 and under the site supervision of a competent person.
- Gas monitoring carried out during drilling.
- Provision of a technical report including site plan, photographs and borehole logs and technical discussion.

No rock cores were recovered from the boreholes.

A site plan and borehole logs are provided in Appendix 1. N

3. Findings

Turf/drift was encountered to depths of 1.30m and 2.10m, with sandstone, mudstone and shale lying beneath.

Voids were encountered in both rotary holes at 13.20m and 14.10m with thicknesses of 700mm and 800mm respectively.

Flush was also lost in both boreholes below corresponding depths of 13.20m and 14.10m.

No hazardous ground gases were recorded on completion of the boreholes.

4. Conclusions

The CMRA identified recorded workings at 13m depth beneath the site with an extraction thickness of 90cm within the Lower Mountain. The drilling investigation encountered voiding at a similar depth to the anticipated depth at which recorded mine-workings was anticipated by the CMRA report. The drilling works have confirmed the presence of these workings and the absence of any other shallower unrecorded shallow workings up to 30.00m bgl.

Based on the 10x seam thickness rule of thumb, given the thickness of competent rock cover above the mine-workings and recorded extraction thickness of 900mm, no remediation will be necessary in regard to site stability as ample rock cover of 11.90m and 12.00m is present.

END OF REPORT

The findings and contents of this (intrusive) Site Investigation Report pertain solely to the study area(s) outlined herein and are based solely on the findings of the excavations undertaken as part of the current exercise unless otherwise stated. The findings and/or recommendations of this report do not take into account any ground conditions that may be present but have hitherto not been encountered and as such further investigation and/or a reconsideration of the findings of this report should be undertaken if such conditions are subsequently encountered or an alternative development plan or land use is subsequently proposed.

This report considers various environmental and/or geological risks posed to the site and/or proposed development and offers advice accordingly as guidance only. The findings of this report will remain valid provided no change of ground or groundwater conditions, either natural or anthropogenic, take place and no warrantee is offered or implied.

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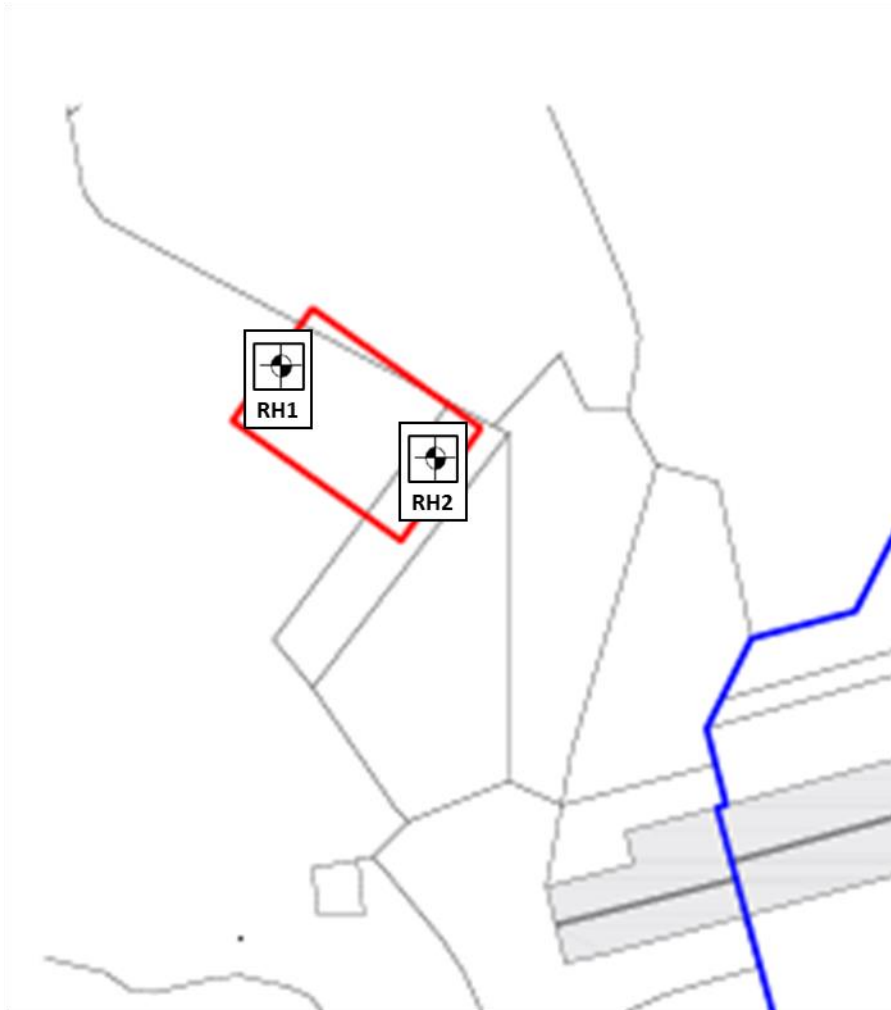
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APPENDIX 1

SITE PLAN & BOREHOLE LOGS

OUR REF: G23401	YOUR REF:	SITE PLAN (NOT TO SCALE)
DATE: 12/01/24	LOCATION: Slip-In Farm, Bacup, Lancashire OL13 8NL	



Key



Rotary Borehole
Location

GEOINVESTIGATE Ltd.

Your Ref.
Our Ref. G23401

RH No.1 Sheet No. 1 of 2
Location: Slip-In Farm, Bacup, Lancashire OL13 8NL

DATE: 12/01/24

Depth (m)	Description of Strata	Thick-ness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
1.30	TURF/brown DRIFT.	1300							
2.70	Light orange SANDSTONE.	1200							2.50
13.20	Grey SANDSTONE with occasional mudstone and shale inclusions.	10500							5.00 7.50 10.00 12.50
13.90	VOID. Lost flush at 13.20m.	700							
	SANDSTONE, MUDSTONE and SHALE.	12600							15.00 17.50 20.00 22.50 25.00

Remarks: Casing to 1.50m
 Microdrill rotary open hole borehole to 30m
 No cores recovered from borehole
 No gas detected from borehole on completion
 Voids and lost flush encountered.

Key:

- | | | | |
|--|---------------|--|---------------------------|
| | Slotted Pipe | | Disturbed sample |
| | Plain Pipe | | Shear vane |
| | Bentonite | | Water sample |
| | Gravel Filter | | Standard Penetration Test |
| | | | Cone Penetration Test |

RH1

GEOINVESTIGATE Ltd.

Your Ref.
Our Ref. G23401

RH No.1 Sheet No. 2 of 2
Location: Slip-In Farm, Bacup, Lancashire OL13 8NL

DATE: 12/01/24

Depth (m)	Description of Strata	Thick-ness	Legend	Gas Well	Sample	Test Type	Test Result	Flush	Depth to Water	Depth (m)
26.50	SANDSTONE, MUDSTONE and SHALE.	12600								
30.00	MUDSTONE.	3500								27.50 30.00

Remarks: Casing to 1.50m
 Microdrill rotary open hole borehole to 30m
 No cores recovered from borehole
 No gas detected from borehole on completion
 Voids and lost flush encountered.

Key:

- | | | | |
|--|---------------|--|---------------------------|
| | Slotted Pipe | | Disturbed sample |
| | Plain Pipe | | Shear vane |
| | Bentonite | | Water sample |
| | Gravel Filter | | Standard Penetration Test |
| | | | Cone Penetration Test |

RH1

GEOINVESTIGATE Ltd.

Your Ref.
Our Ref. G23401

RH No.2 Sheet No. 1 of 2
Location: Slip-In Farm, Bacup, Lancashire OL13 8NL

DATE: 12/01/24

Depth (m)	Description of Strata	Thick-ness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
2.10	TURF/brown DRIFT.	2100							
4.30	Light yellowish brown SANDSTONE.	2200							2.50
14.10	Grey/dark grey SANDSTONE with occasional mudstone and shale inclusions.	9800							5.00 7.50 10.00 12.50
14.90	VOID. Lost flush at 14.10m.	800							15.00
	SANDSTONE, MUDSTONE and SHALE.	11900							17.50 20.00 22.50 25.00

Remarks: Casing to 1.50m
 Microdrill rotary open hole borehole to 30m
 No cores recovered from borehole
 No gas detected from borehole on completion
 Voids and lost flush encountered.

Key:

	Slotted Pipe		Disturbed sample
	Plain Pipe		Shear vane
	Bentonite		Water sample
	Gravel Filter		Standard Penetration Test
			Cone Penetration Test

RH2

GEOINVESTIGATE Ltd.

Your Ref.
Our Ref. G23401

RH No.2 Sheet No. 2 of 2
Location: Slip-In Farm, Bacup, Lancashire OL13 8NL

DATE: 12/01/24

Depth (m)	Description of Strata	Thick-ness	Legend	Gas Well	Sample	Test Type Result	Flush	Depth to Water	Depth (m)
26.80	SANDSTONE, MUDSTONE and SHALE.	11900							
30.00	MUDSTONE.	3200							27.50 30.00

Remarks: Casing to 1.50m
 Microdrill rotary open hole borehole to 30m
 No cores recovered from borehole
 No gas detected from borehole on completion
 Voids and lost flush encountered.

- Key:**
- | | | | |
|--|---------------|--|-----------------------------|
| | Slotted Pipe | | O Disturbed sample |
| | Plain Pipe | | Cv Shear vane |
| | Bentonite | | W Water sample |
| | Gravel Filter | | S Standard Penetration Test |
| | | | C Cone Penetration Test |

RH2

APPENDIX 2

SI PHOTOS & DRILLING PERMIT







The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 27612

Name and Address of Permit Holder:

*Lite Ltd
Unit 2
Farrington Place
Burnley
BB11 5TY*

Site Location:

*Slip In Farm
Bacup
Lancashire
OL13 8NL*

This certificate hereby grants the above named Permit Holder a Permit to carry out:-

A Ground Investigation comprising three boreholes to 30m within the Authority's interests at the identified site location above as shown on the Grant Permit Boundary (overleaf) for the period of **12 months** from the granted date shown below. *The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Permit Holder's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.*

Conditions:

- *Manned entry (i.e.) into mine entries/workings) is strictly prohibited.*
- *Water flush*
- *Gas Monitoring CO, CH₄, CO₂, O₂, H₂S at borehole and rig*
- *Operators undertaking the work must be in possession of this certificate and the Permit boundary plan at the time of works*
- *Appropriate borehole sealing without delay and to withstand site level changes*

Signed: Michael Amirtash Granted Date: 1st December 2023

For and on behalf of The Coal Authority

*Nominated Representative: Michael Amirtash, Permitting Manager;
The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG
Tel: 01623 637450; E-Mail: permissions@coal.gov.uk*



The Coal
Authority

Granted Permit Boundary

Permit Ref: 27612

Permit Boundary:



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