

Mr R. Agus
Office One
34 Victoria Road
Barnsley
S70 2BU

**CAPE SITE SERVICES
COAL MINING & GEOTECHNICAL
CONSULTANCY**

Web: www.cape-site.co.uk
Email: cape-site@btconnect.com
Tel: 01226 725050

Date: 31st March 2021
Your ref: (S75 2LJ)
My Ref: SI 00256

FOR THE ATTENTION OF ROB AGUS & MARK DUNLAVEY

Dear Sir,

**COAL MINING RISK INTERPRETATION REPORT – FOLLOWING THE SITE
INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT AT 65 WHARFEDALE
ROAD, POGMOOR, BARNSELEY S75 2LJ**

I am pleased to supply the following report for the above named project and trust that this satisfies your requirements. Please do not hesitate to contact myself at any time for further clarification or advice.

Yours Sincerely,

M Lyons

M. Lyons
Consultant Mining Engineer
BSci CSci MIMMM

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**CAPE SITE SERVICES
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1. Introduction

Planning permission is being considered for the development of a detached bungalow at the above location subject to the mining legacy risks been fully realised and mitigated from on site, if necessary. Cape Site Services has now undertaken this work via an intrusive site investigation of 2 boreholes, the location of which is outlined on plan no. 00256/B – as illustrated in appendix 5.2. The work is being undertaken in support of the application to Barnsley MBC ref: 2020/0267.

2. Scope of the Report

The mining legacy risks to the development are as follows:

- Instability from shallow coal workings in the Barnsley coal seam
- Colliery spoil / made ground / associated contamination
- Uncharted mine entries
- Fugitive gas emissions

As such, these risks need to be properly determined to ensure sound stability for the development. A borehole investigation consisting of 2 or 3 holes was deemed a reasonable level of investigation in the outset regarding potential void migration given the scale and nature of development combined with the available geological and mining information as detailed in the Coal Mining Risk Assessment ref: Dit/19/155 dated March 2020 – as prepared by Design It Structural Solutions Ltd. A watching brief would also be implemented for any signs of mine entries.

It should be noted that this investigation is focused mainly on determining stability from potential shallow historic coal workings and will only provide limited information regarding the risks of uncharted mine entries. A good level of detail should be obtained to provide a more informed opinion as to fugitive gas risks and the potential for colliery spoil and/or contamination.

The works were undertaken under the Coal Authority permit ref: 21722 as illustrated in appendix 5.5.

It should be noted that the details of this report should be presented to suitably qualified design/structural engineers to use the information provided in order to arrive at an agreed foundational solution with the regulators and Coal Authority prior to any further works taking place.

3. Site Investigation

3.1 Methodology

Prior to the intrusive site investigation, a search for utilities was undertaken both via online data providers and physically on site using a Cable Avoidance Tool (CAT). Boreholes were marked out with tape measure from boundary and building lines as illustrated on plan no. 00256/B outlined in appendix 5.2. As part of the mine entry watching brief, a pre survey was undertaken with no visible evidence of any uncharted mine entries. The process for the intrusive coal seam investigation is outlined via the system chart in appendix 5.4.

An investigation utilising a tracked Baretta Rotary Drill Rig equipped with 2m long 70mm diameter drill rods and 100mm drill bit was utilised along with water flush technique to analyse returns and minimise any risks associated with mine gas emissions and spontaneous combustion. Gas monitoring equipment would be employed during works for risks associated with Methane, Carbon Monoxide, Carbon Dioxide and Oxygen depletion. Any boreholes emitting a dangerous level of methane would be terminated and sealed immediately. All holes to be filled and sealed as soon as possible with bentonite upon termination. Prior agreement had been secured for these works from the Coal Authority -permit ref: 21722 as illustrated in appendix 5.5.

The works were to be supervised by the Drilling Engineers Mr. S. Fish and Mr I. Wiles, and overseen by the Principal Engineer Mr. M. Lyons.

3.2 Interpretation of Findings

Topsoil and fill were encountered to depths of 0.6m in borehole no.1 and 1.8m in borehole no.2. A firm yellow/grey clay is then present to a depth of around 2.8m, below which is brown sandstone interbedded with silty grey mudstone.

Borehole number 1 encountered very soft and partially voided ground from 5.5m to 11m before regaining relatively firm strata. Total loss of flush was experienced at 5.5m; no dangerous levels of gas were noted either at the rig or held for a short period at the hole entrance.

Borehole number 2 encountered the same very soft voided ground but at 11.5m to 13.5m deep within more firm strata than the base of borehole no.1. Total loss of flush was experienced at 11.5m; no dangerous levels of gas were noted either at the rig or held for a short period at the hole entrance.

Given the above, it is clear that old underground coal workings have been encountered and it is considered that the top of Barnsley seam lies at around 11.5m deep. Borehole number 1 appears to have encountered collapsing ground above the old workings (void migration) and may well have firmed up within the consolidated collapsed material itself. The firm base below the coal/workings is likely to be circa 14m deep across the site.

4. CONCLUSIONS AND RECOMMENDATIONS

(Based on CIRIA C758D – abandoned mine working manual)

- 1) Remediation strategies for safe development given the findings are likely to consist of one or a combination of the following:
 - a. Drilling and grouting the shallow voids – for example on a 3m x 3m grid across and just outside of the proposed development footprint with a 1.5m spaced grout curtain down-dip to the north-east;
 - b. Piled foundations with ring beam – piles could be sited in the firm ground beneath the workings at a depth of around 16m or so (depending on the advice of the appointed piling contractor). Pile designs that maintain the integrity of the sandstone above the workings would be beneficial.
 - c. Strengthened foundations, strip or raft - to span and cantilever a 3m soft spot for example.
- 2) No signs of any mine entries were observed during the investigation; however some risks are always present within the exposed coalfield for discovering such features, particularly when shallow coal workings are present. Watching briefs should be undertaken during future ground works for any associated signs of either an old mine shaft or adit – grey circular areas of fill within the natural clay would be an indication in this instance.

The Coal Authority should be notified if a mine entry is suspected.
- 3) No fugitive gases were encountered, although given the presence of the shallow Barnsley coal workings (which is known to be generally of a gaseous nature), gas mitigation measures such as a methane membrane and/or positive ventilation would be recommended. A period of gas monitoring could be utilised to ascertain such requirements in more detail if desired.
- 4) It should be noted that another Permit will be required from the Coal Authority for any further works that will intersect their interests (coal/coal workings), such as piled foundations and/or drilling and grouting, in order to gain permission, understand their requirements and design the works accordingly.

NOTE: This report and future development proposals should be submitted to the regulators for their approval prior to any works taking place.

I trust that this satisfies your requirements, however please do not hesitate to contact myself at any time for further clarification or advice.

Yours Sincerely,

M Lyons

M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

Enc.

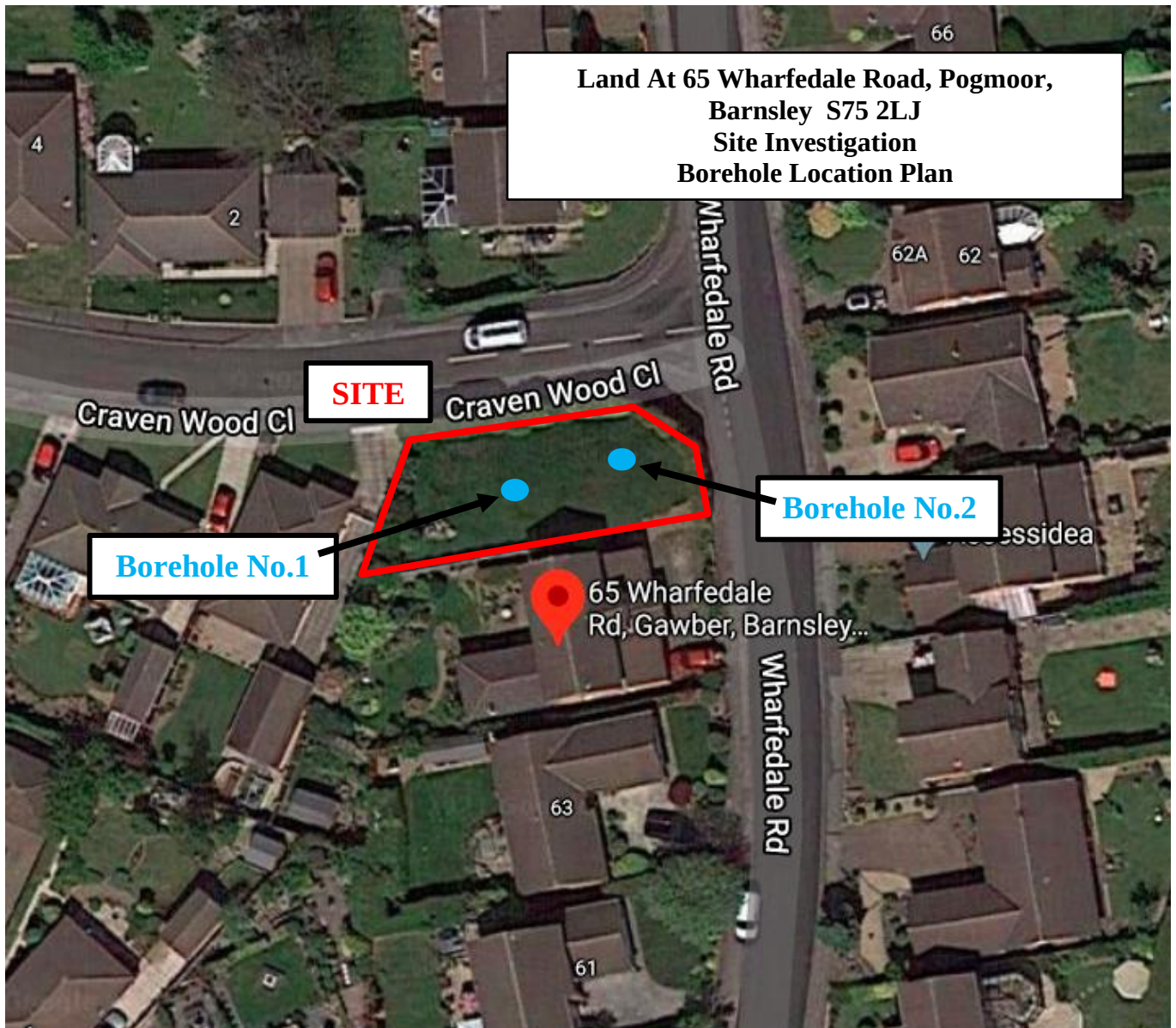
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5 Appendix

5.1 References

- 5.1.1 CIRIA C758D ‘Abandoned Mine Working Manual’.
- 5.1.2 British Standards Institution: BS 5930:2015 ‘Code of practice for ground investigations’ BSI 2015.
- 5.1.3 British Standards Institution: BS EN ISO 14688-1: 2002 + A1 2013 ‘Geotechnical Investigation and Testing - Identification and Classification of Soil - Part 1 - Identification and Description. BSI 2013.
- 5.1.4 British Standards Institution: BS EN ISO 14689-1: 2003 ‘Geotechnical Investigation and Testing – Identification and Classification of Rock – Part 1 – Identification and Description. BSI 2003. Incorporating Corrigendum No. 1 February 2007.
- 5.1.5 British Standards Institution: BS 10175 ‘The Investigation of Potentially Contaminated Sites. Codes of Practice’. BSI 2011+A1 2013.
- 5.1.6 British Standards Institution: BS EN ISO 22476-3: 2005 + A1 2011 ‘Geological Investigating and Testing. Field Testing. Standard Penetration Test’.
- 5.1.7 British Standard 1377:1990 Parts 1-9 ‘Methods of Test for Soils for Civil Engineering Purposes’.

5.2 Borehole Location Plan 00256/B (Not To Scale)



5.3 Drilling log sheets

Client: Lyons CMC	Site: 65 Wharfedale Road, Pogmoor, Barnsley. S75 2LJ	Cape Site Services Ltd Unit 2, Rear of castle buildings, Carlton Road, Barnsley, South Yorkshire, S71 3HX	
Date: 24/03/2021	METHOD Rotary Water flush		

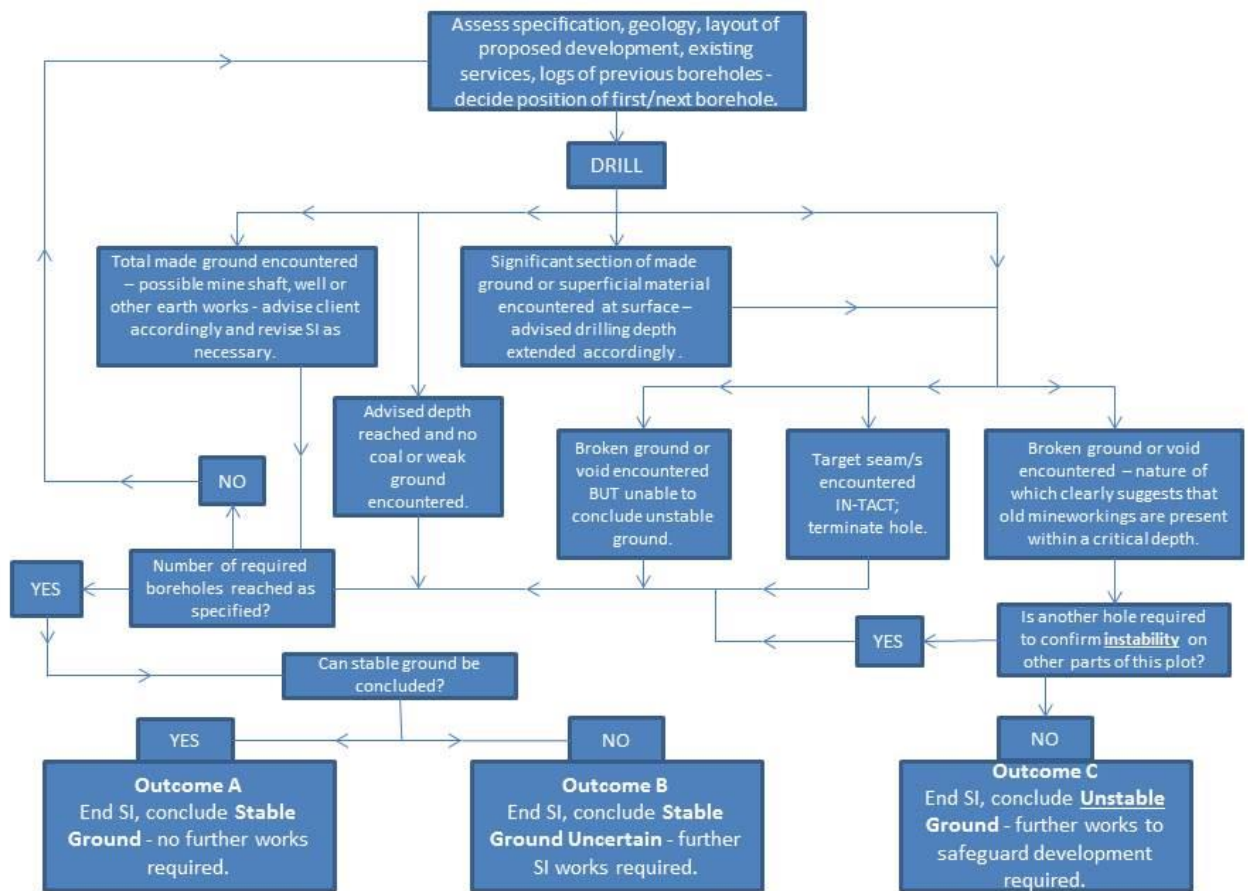
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Driller I Wiles	Driller's Assistant S Fish & R Hawkins
Driller's Signature 	Page ...1..... of 1.....

5.4 Site Investigation Process

Borehole Site Investigation (SI) Process Guide (Shallow Underground Coal Workings)

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5.5 Coal Authority Permit 21722:



The Coal
Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 21722

Name and Address of Permit Holder:

Lyons CMC
44 Grange Road
Woodlands
Doncaster
DN6 7PZ

Site Location:

Land at
65 Wharfedale Road
Pogmoor
Barnsley
S75 2LJ

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

Ground investigation by three boreholes to c.30m bgl

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:

- Water flush
- Gas Monitoring CO, CH₄, CO₂, O₂, 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: Darren Hurst Granted Date: 15 March 2021

For and on behalf of The Coal Authority

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