CAPE SITE SERVICES
COAL MINING & GEOTECHNICAL CONSULTANCY
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Tel: 01226 725050

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

Date: 10th August 2021
Your ref: (S71 1UA)
My Ref: SI 00247

FOR THE ATTENTION OF MR R AGUS

Dear Sir,

COAL MINING RISK INTERPRETATION REPORT – FOLLOWING THE SITE INVESTIGATION FOR PROPOSED RESIDENTIAL DEVLOPMENT AT CARLTON ROAD, SMITHIES, BARNSLEY S71 1UA

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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1. Introduction

Planning permission is being considered for the development of a detached dwelling 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 3 boreholes, the location of which is outlined on plan no. 00247/B – as attached and illustrated in appendix 5.2.

2. Scope of the Report

The mining legacy risks to the development are as follows:

- Instability from shallow underground coal workings
- Geological faulting/unstable bedrock
- 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 3 to 6 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. 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.

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 lines as illustrated on plan no. 00247/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 unchartered 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 100mm diameter drill rods was deemed appropriate in this instance 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, Oxygen and Carbon Dioxide. 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: 22377 – as attached for reference in appendix 5.5.

Considering the geological/mining details and CMRA report (ref: CMRA 00247 by ourselves dated 2nd December 2020) boreholes were decided to be taken to the base of the second seam (if no workings were encountered in the first seam) or to maximum depths of 25m if no coal is encountered.

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

All boreholes proved a similar section of strata with around 300mm of fill above firm clays to around 1.5m deep. Below this are middle coal measure mudstones and sandstones with the first coal seam encountered at between 7.2m and 8m deep, which the driller noted as 'dirty coal' of around 1m in thickness. Further sandstones with interbedded mudstones were then encountered to the second coal seam at between 18m to 18.5m deep – drillers notes indicating around 1.2m of 'coal with mudstone', relatively soft in borehole no. 1. Hard mudstone was encountered beneath the second coal seam, in which flush/returns were lost, possibly indicating opened out bedding planes that may be associated with the nearby geological faulting. Drilling remained firm however, and as the coal seams had been proved to be in-tact, boreholes were terminated at this horizon without waiting for any length of time for flush to return.

No signs of underground shallow workings or unstable ground were encountered in any hole, with no fugitive gases detected at any point during the drilling operations.

The logs appear to match well at the same elevation which would infer no signs of any geological faulting between the borehole locations.

Given the findings no further holes were deemed necessary.

4. CONCLUSIONS AND RECOMMENDATIONS

1) Given the nature of the geology and target coal seam/s no further drilling was or is deemed necessary and the site can be regarded as stable from the shallow mining perspective. As such the development can proceed with usual foundation designs in line with the appointed building control officer at the time of development. It should be noted however that other features at shallow depth in areas not covered by this investigation should not be ruled out.

2) No signs of any mine entries were observed during the investigation, however slight risks are always present within the exposed coalfield for discovering such features. Watching briefs would be prudent during future ground works for any associated signs of either an old mine shaft or adit. The Coal Authority should be notified where any such feature is suspected.

3) Given the findings it is unlikely that the property is affected by geological faulting, however associated watching briefs during future ground/foundation works would be recommended for signs of weak ground, with appropriate strengthening/treatment considerations if any is suspected/encountered.

4) No fugitive gases were encountered, and given the geology the risk of such is considered low.

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.

THIS SITE INVESTIGATION INTERPRETATIVE REPORT IS BASED ON AND LIMITED TO THE INFORMATION IN MY RECORD AT THE TIME THE ENQUIRY IS ANSWERED. It is based on my professional opinion in line with the guidelines set out in CIRIA Special Publication 32 - "Construction Over Abandoned Mine Workings." The opinion may be overruled by Government Authorities based on other information not in my record. Further site investigations may be undertaken which would supersede the factual findings of this investigation. Copyright in this report belongs to M.A.Lyons. All rights are reserved and unauthorised use is prohibited. Copyright is not transferred to external parties by possession of this report, however, those for whom the report is compiled have the right to use it. If any unauthorised third party comes into possession of this report, they rely upon it entirely at their own risk and the author does not owe them any Duty of Care or Skill.

5 Appendix

5.1 References

5.1.1 CIRIA C758D ‘Abandoned mine workings 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.

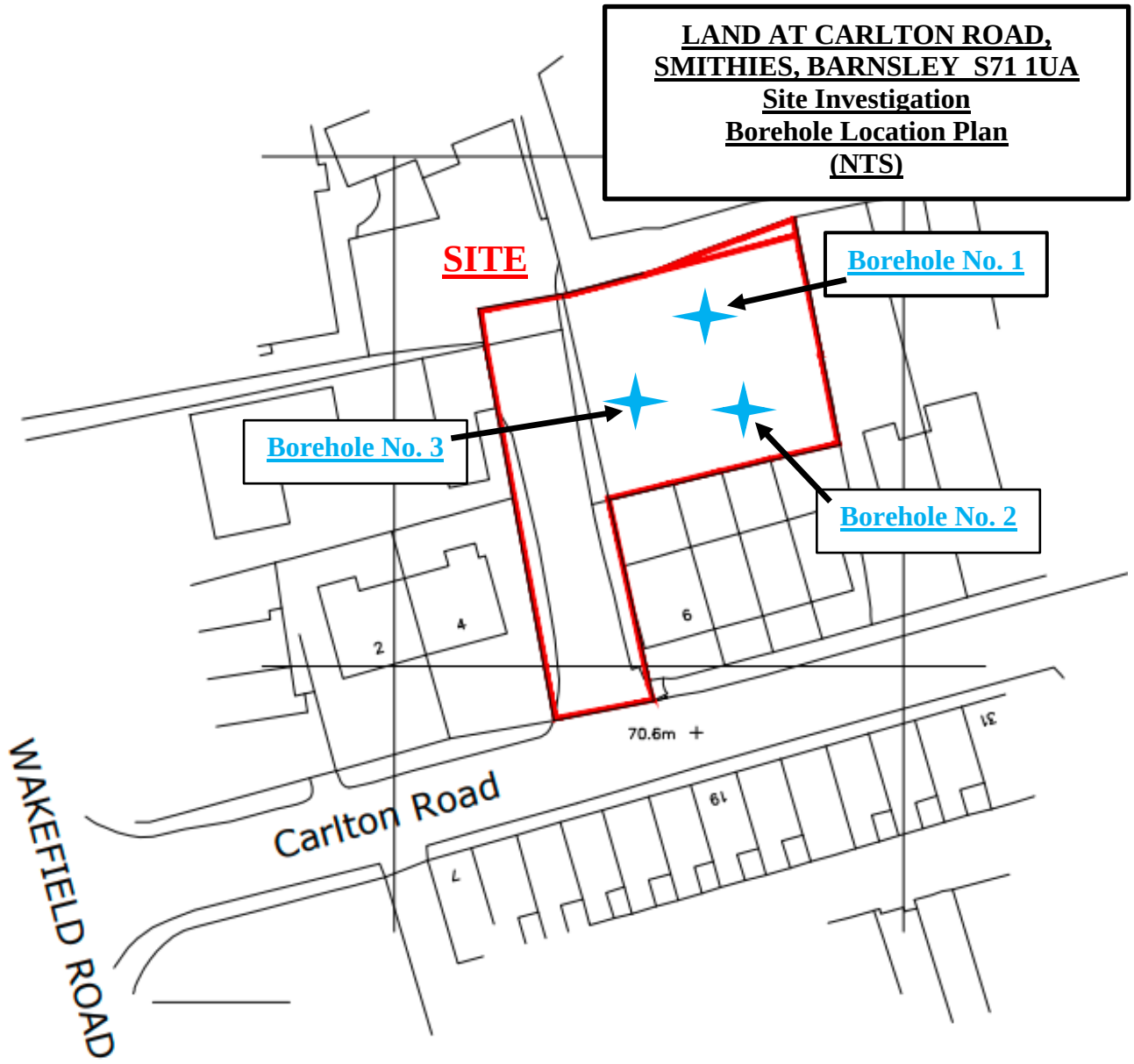
5.1.4 British Standards Institution: BS EN ISO 14689-1: 2003 ‘Geotechnical Investigation and Testing – Identification and Classification of Rock – Part 1 – Identification and Description. BSI 2003. Incorporating Corrigendum No. 1 February 2007.

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 Stardard 1377:1990 Parts 1-9 ‘Methods of Test for Soils for Civil Engineering Purposes’.

5.2 Borehole Location Plan No. 00247/B



5.3 Drilling log sheets

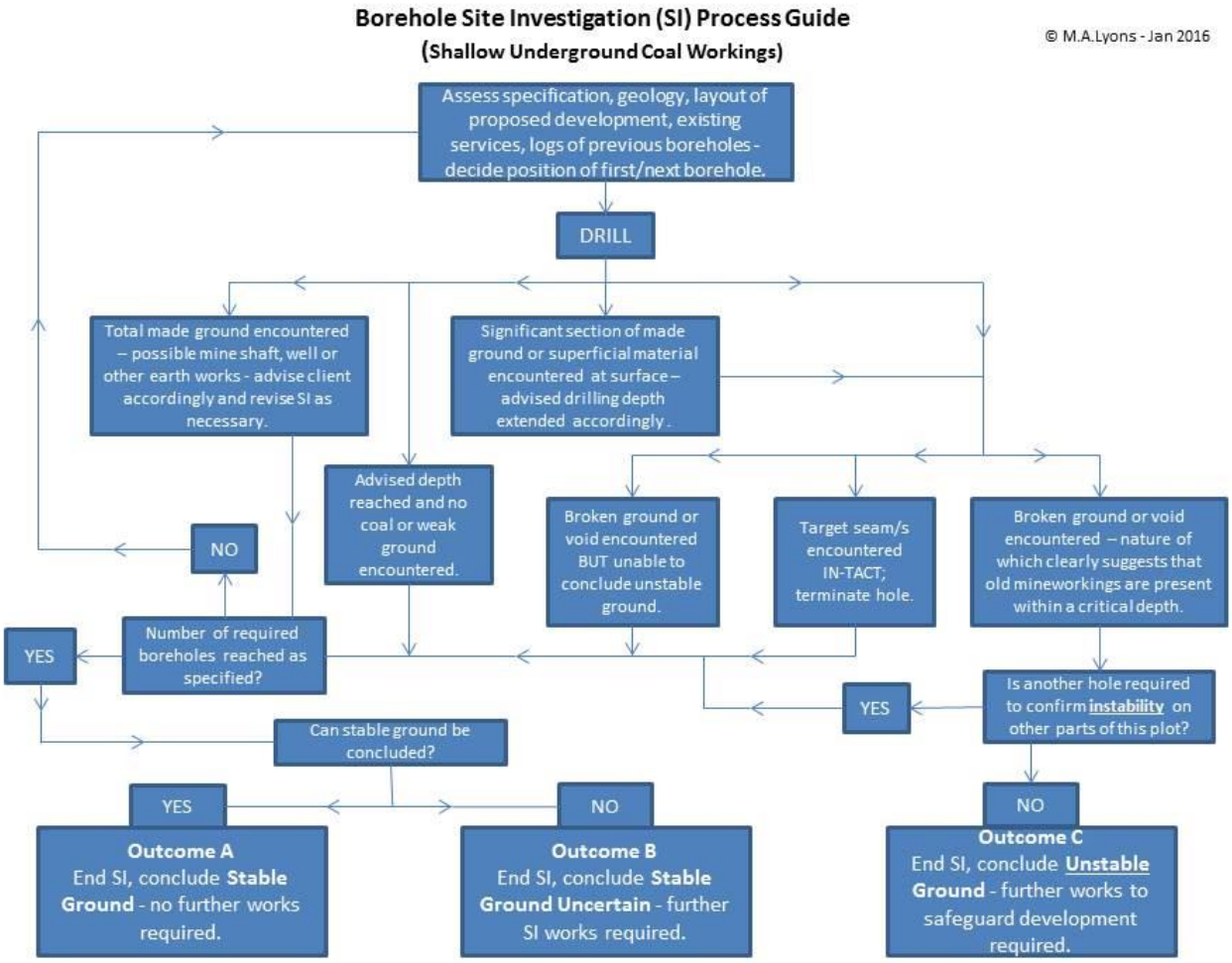
Client: Lyon CMC	Site: Land behind 6 Carlton Rd, Smithies, Barnsley. S71 1UA	Cape Site Services Ltd Unit 2, Rear of castle buildings, Carlton Road, Barnsley, South Yorkshire, S71 3HX	
Date: 02/08/2021	Method Rotary water flush		

Measurements In Meters

BH no	FROM	TO	THICKNESS	Description
1				
	0.0	0.3	0.3	Topsoil
	0.3	1.5	1.2	Clay sandy yellow grey
	1.5	2.5	1.0	Clay grey soft
	2.5	3.5	1.0	Mudstone grey sandy soft
	3.5	8.0	4.5	Mudstone silty grey
	8.0	9.0	1.0	Coal dirty with some water loss
	9.0	11.0	2.0	Mudstone grey silty
	11.0	18.5	7.5	Sandstone with interbeded mudstone bands grey brown
	18.5	19.7	1.2	Coal with black mudstone soft to bottom
	19.7	20.5	0.8	Mudstone grey hard lost flush & returns
2				
	0.0	0.3	0.3	Topsoil
	0.3	1.4	1.1	Clay sandy brown yellow
	1.4	3.3	1.9	Sandstone brown
	3.3	7.6	4.3	Mudstone grey silty soft
	7.6	8.8	1.2	Coal dirty
	8.8	10.9	2.1	Mudstone silty grey
	10.9	18.4	7.5	Sandstone with interbed mudstone bands grey brown
	18.4	19.7	1.3	Coal with black mudstone
	19.7	20.0	0.3	Solid no returns lost water
3				
	0.0	0.3	0.3	Topsoil
	0.3	1.5	1.2	Clay sandy brown yellow
	1.5	3.2	1.7	Sandstone brown
	3.2	7.2	4.0	Mudstone grey silty soft
	7.2	8.2	1.0	Coal dirty
	8.2	10.5	2.3	Mudstone silty grey
	10.5	18.0	7.5	Sandstone with interbed mudstone bands grey brown
	18.0	19.1	1.1	Coal with black mudstone
	19.1	20.0	0.9	Solid no returns lost water

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

5.4 Site Investigation Process



5.5 Coal Authority Permit

The Coal Authority

Permit to Enter or Disturb Coal Authority Interests

Permit 22377

Name and Address of Permit Holder:

Lyons CMC
44 Grange Road
Woodlands
Doncaster
DN6 7PZ

Site Location:

Land rear of
6 Carlton Road
Smithies
Barnsley
S71 1UA

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

A Ground Investigation comprising six boreholes to 25m 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, CH_4, CO_2, O_2, H_2S 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: *23rd July 2021*

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