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**LYONS CMC  
COAL MINING & GEOTECHNICAL  
CONSULTANCY**

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Mob: 07887555580

Date: 29<sup>th</sup> October 2025  
Your ref: (S75 1DX)  
My Ref: SI 00404

**FOR THE ATTENTION OF SCOTT CLAYBURN**

Dear Sir,

**COAL MINING RISK INTERPRETATION REPORT – FOLLOWING THE SITE  
INVESTIGATION FOR PROPOSED RESIDENTIAL DEVELOPMENT AT LAND REAR OF 49 TO  
55 WOODSTOCK ROAD, BARNSELY S75 1DX**

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 has been granted for a new residential 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 6 boreholes, the location of which is outlined on plan no. 00404/B – as attached and illustrated in appendix 5.2. The site is centred at OS NGR: 433830E / 407835N.

## 2. Scope of the Report

The mining legacy risks to the development are as follows:

- Instability from shallow underground coal workings
- Uncharted Mine Entries

As such, these risks need to be properly determined to ensure sound stability for the development. A borehole investigation consisting of 6 boreholes 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.

## 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. 00404/B outlined in appendix 5.2.

An investigation utilising a tracked Beretta Rotary Drill Rig equipped with 2m long 75mm diameter drill rods was deemed appropriate in this instance along with water flush techniques 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, Carbon Dioxide and Hydrogen Sulphide. The works are to be undertaken under Coal Authority -permit ref: 30744.

Considering the available detail boreholes were decided to be taken to the base of the first coal seam (Kents Thin or Thick) or to 20m if no coal is encountered – the anticipated separation between these seams is considered as being ‘enough cover’ to ensure no interaction from a

void migration aspect; and no workable seams are anticipated below the lower Kents Thick coal seam to be of affect from a shallow unrecorded mining aspect.

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

### **3.2 Interpretation of Findings**

Drilling log sheets for all boreholes are outlined in appendix 5.3.

All boreholes proved natural superficial yellow/brown/grey clay (beneath 0.3m of made ground in BH's 1,3,4 &5; and 0.5m of made ground in BH2) to depths ranging between 2m in BH4 and 2.8m in BH1. Bedrock was determined in all holes beneath this clay comprising of grey (some brown) silty soft mudstone. An in-tact coal seam was encountered within the mudstone at: 4.4m to 5.8m in BH1; 4.0m to 5.5m in BH2; 4.1m to 5.7m in BH3; 3.9m to 5.4m in BH4; 4.1m to 5.5m in BH5 (with a dirt band at 5.1m to 5.3m); and 3.9m to 5.7m in BH6. Given the BGS and mining information in this vicinity it was considered that this coal seam (ranging in thickness of between 1.4m to 1.8m) is more likely to be the Kents Thick coal seam, given that the 'Kents Thin' seam is known locally to only be up to around 0.6m in thickness. As such, all holes were terminated in firm grey/brown silty mudstone to over 1m below the coal seam. Some loss of water flush was experienced: at the base and below the coal seam in BH3 (then totally lost below the seam at 7m); slightly within the coal seam in BH4; and above the coal seam in BH6 which recovered whilst in the coal seam. The loss of flush did not appear to be a result of associated coal workings – it was considered likely (given the lay of the land sloping to the north-east) that it is related to cambering fracturing of the strata that could have been weakened by past deep coal mining in the area.

No signs of underground shallow workings or unstable ground were encountered at any of the six borehole locations and no fugitive gases were detected at any point during the drilling operations. There were no signs of colliery spoil material within the made ground at the surface to indicated past coal mining activity.

The logs appear to match well given anticipated strata dip rates/directions, which would infer no signs of any geological faulting between the borehole locations.

## **4. CONCLUSIONS AND RECOMMENDATIONS**

- 1) Although (what is believed to be) the 'Kents Thick' coal seam is present within an influencing depth of the proposed development, the six boreholes undertaken have proved stable ground conditions across the proposed footprint areas investigated. Given the findings combined with the nature/scale of proposed development it would seem a balanced and prudent approach to offer an element of strengthening within foundations (such as a raft or strengthened strip footings with two layers of mesh for example; appropriately designed by a structural engineer to span a 3m soft spot and cantilever 1.5m), in order to accommodate any

residual slight risks within areas not covered by this investigation. Regulators should be consulted for their agreement of any such proposals prior to development taking place.

- 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 - grey circular areas of fill material within natural bedrock would be an indication of an old mine shaft for example. The Mining Remediation Authority should be notified where any such feature is encountered or suspected.
  
- 3) No fugitive gases were encountered during this investigation; given the findings (overlying clays and mudstones) the associated risks of such would be considered low. However, it may be prudent, in the absence of any further gas monitoring (*note informative no. 3 in appendix 2*), to include gas protection measures (such as a methane membrane for example) within future foundation designs; which could also protect from radon issues if required. All usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place.

***Note: should there be any uncertainty of actual conditions during future ground works Lyons CMC or indeed the Coal Authority themselves can be further consulted for on site assessment if necessary.***

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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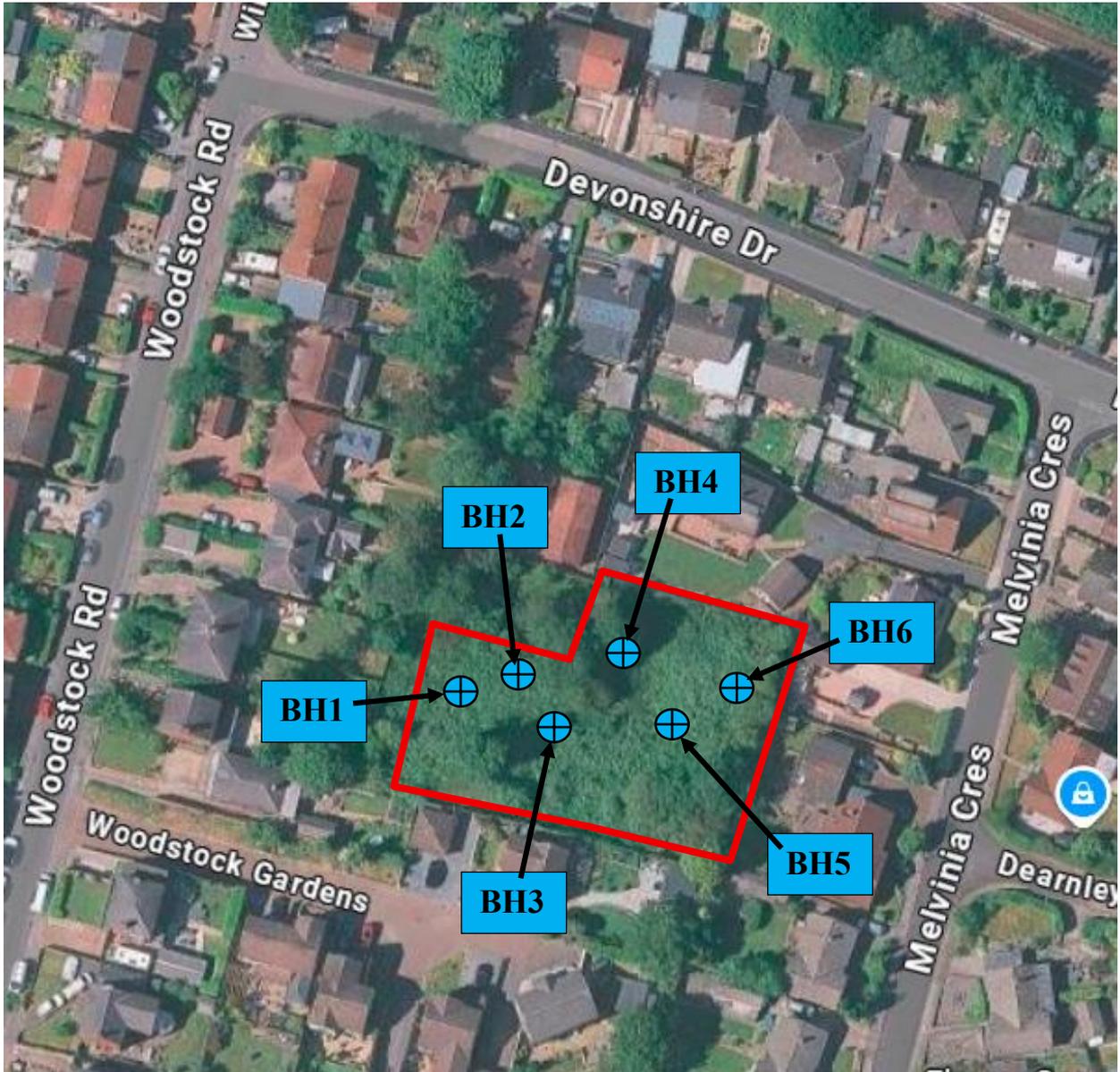
## 5 Appendix

### 5.1 References

- 5.1.1 CIRIA C758D 'Abandoned mine 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 Standard 1377:1990 Parts 1-9 'Methods of Test for Soils for Civil Engineering Purposes'.

5.2 Borehole Location Plan No. 00404/B

**Borehole Site Investigation Plan 00404/B**  
**Development at:**  
**49 to 55 Woodstock Road, Barnsley S75 1DX**  
**NGR: 433830E / 407835N (NTS)**



### 5.3 Drilling log sheets

<b>Client:</b> Lyons CMC	<b>Site:</b> Land at 49 to 55 Woodstock Road, Barnsley. S75 1DX		<b>Cape Site Services</b> unit 2, rear of Castle Buildings Carlton Road, Barnsley, S71 3HX	
<b>Date:</b> 10/10/2025	<b>Method:</b> water flush	<b>Permit No:</b> 30458		
<b>Driller:</b> Ian Wiles		<b>Driller Assistant:</b> Simon Fish		
		<b>Page No:</b> 1		

#### Measurements In Meters

BH No:	FROM	TO	THICKNESS	DESCRIPTION
1				
	0	0.3	0.3	Made ground
	0.3	2.8	2.5	Clay yellow grey
	2.8	4.1	1.3	Mudstone grey silty soft
	4.1	4.4	0.3	Mudstone black
	4.4	5.8	1.4	Coal
	5.8	6.2	0.4	Mudstone light grey
	6.2	9	2.8	Mudstone grey brown silty
				No gases recorded
2				
	0	0.5	0.5	Made ground
	0.5	2.6	2.1	Clay yellow grey
	2.6	4	1.4	Mudstone grey silty soft
	4	5.5	1.5	Coal some mudstone black
	5.5	5.8	0.3	Mudstone light grey
	5.8	8	2.2	Mudstone grey brown silty
				No gases recorded
3				
	0	0.3	0.3	Made ground
	0.3	2.7	2.4	Clay yellow grey
	2.7	4.1	1.4	Mudstone grey silty soft
	4.1	5.7	1.6	Coal Very soft to bottom water loss
	5.7	5.8	0.1	Mudstone light grey
	5.8	7	1.2	Mudstone grey brown silty
				Total water lost stopped No returns
				No gases recorded

**Measurements In Meters**

BH No:	FROM	TO	THICKNESS	DESCRIPTION
5				
	0	0.3	0.3	Made ground
	0.3	2.3	2	Clay yellow grey
	2.3	4.1	1.8	Mudstone grey silty soft
	4.1	5.1	1	Coal
	5.1	5.3	0.2	Mudstone grey
	5.3	5.5	0.2	Coal
	5.5	7	1.5	Mudstone grey brown silty
				No gases recorded
4				
	0	0.3	0.3	Made ground
	0.3	2	1.7	Clay yellow brown grey silty sandy
	2	3.7	1.7	Mudstone grey brown silty soft
	3.7	3.9	0.2	Mudstone black dust
	3.9	5.4	1.5	Coal some water loss 20%
	5.4	7	1.6	Mudstone grey brown silty
				Got full water back before finish
				No gases recorded
6				
	0	2.7	2.7	Clay yellow brown grey silty sandy
	2.7	3.2	0.5	Mudstone grey brown silty
	3.2	3.9	0.7	Mudstone grey brown silty 70% water lost not much returns
	3.9	5.7	1.8	Coal got water back small amount of loss
	5.7	7	1.3	Mudstone grey brown silty
				No gases recorded

## Appendix 5.4 Informative(s):

- 1) The relatively recently revised CIRIA document titled ‘Abandoned Mine Workings Manual’, which replaced Special Publication 32 (1984), indicates that the use of empirical or ‘rule of thumb’ guides, as the design basis for treatment depth, has been successfully observed for many years for a wide range of abandoned mine workings and overlying rock/soil strata scenarios. As such, the guidance indicates that further design/ground stabilisation considerations will be required if there is less than 10 times the aggregate measured height of mine workings as competent rock cover above the workings.
- 2) For information, should the grouting of any mine workings be required, a 10:1 PFA/cement mix or similar would need to be injected into the workings and any other disturbed strata above it under pressure on an OS coordinated treatment grid approved by the Coal Authority (and Building Control/third-party Warranty provider as required). Specific proposals to treat any mine workings would need to be submitted in the form of a standalone ‘Specification’, with a separate permit to treat being obtained from the Coal Authority. The method of consolidation is dependent on the nature of the bedrock strata and the underground mining conditions encountered, although fissile strata, such as shales and mudstone deposits, do permit mining voids to migrate upwards to quite high levels. All grouting works would need to be supervised by a competent engineer, with a final validation report being produced to confirm what works were undertaken and whether they were successful or not.
- 3) Ground gas monitoring can be undertaken to confirm or discount the presence of an elevated gassing regime within the underlying soils. Elevated concentrations of mine gases (e.g. CO<sub>2</sub>, CH<sub>4</sub>) may be present within the coal seams, voids in or above any shallow mine workings, areas of made ground/opencast backfill, and in any permeable bedrock strata (and any organic rich surficial soils). The period of monitoring to be undertaken should be broadly completed in accordance with current guidance [BS8485]. Piezometers would need to be installed (during drilling works for example) to facilitate this.