

**Paul Woodcock
C/O Bence Farm Cabins
Bence Farm
Barnsley Road
Darton S75 5NT**

**LYONS CMC
COAL MINING & GEOTECHNICAL
CONSULTANCY**

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Date: 8th June 2021
Your ref: (S75 5NT).
My Ref: CMRA 00261

FOR THE ATTENTION OF MR PAUL WOODCOCK

Dear Sir,

COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED DEVELOPMENT AT BENCE FARM, BARNSELY ROAD, DARTON, BARNSELY S75 5NT

Introduction

Planning permission is being sought for the development of two cabins (for temporary accommodation/holiday lettings usage) at the above named site, the location and design of which can be seen on the attached plan No. 00261/A in Appendix 1. Each cabin will consist of a predominantly single steel framed (wooden panelled) room including a partial mezzanine upper floor sleeping area. The site is centred around national grid reference E: 431325 / N: 409318. A Coal Mining Risk Assessment is required for the proposals, in order to competently address the mining legacy for the site and determine what impact this may have had upon the land. The assessment is intended to be included as a supporting document to a future planning application to Barnsley MBC.

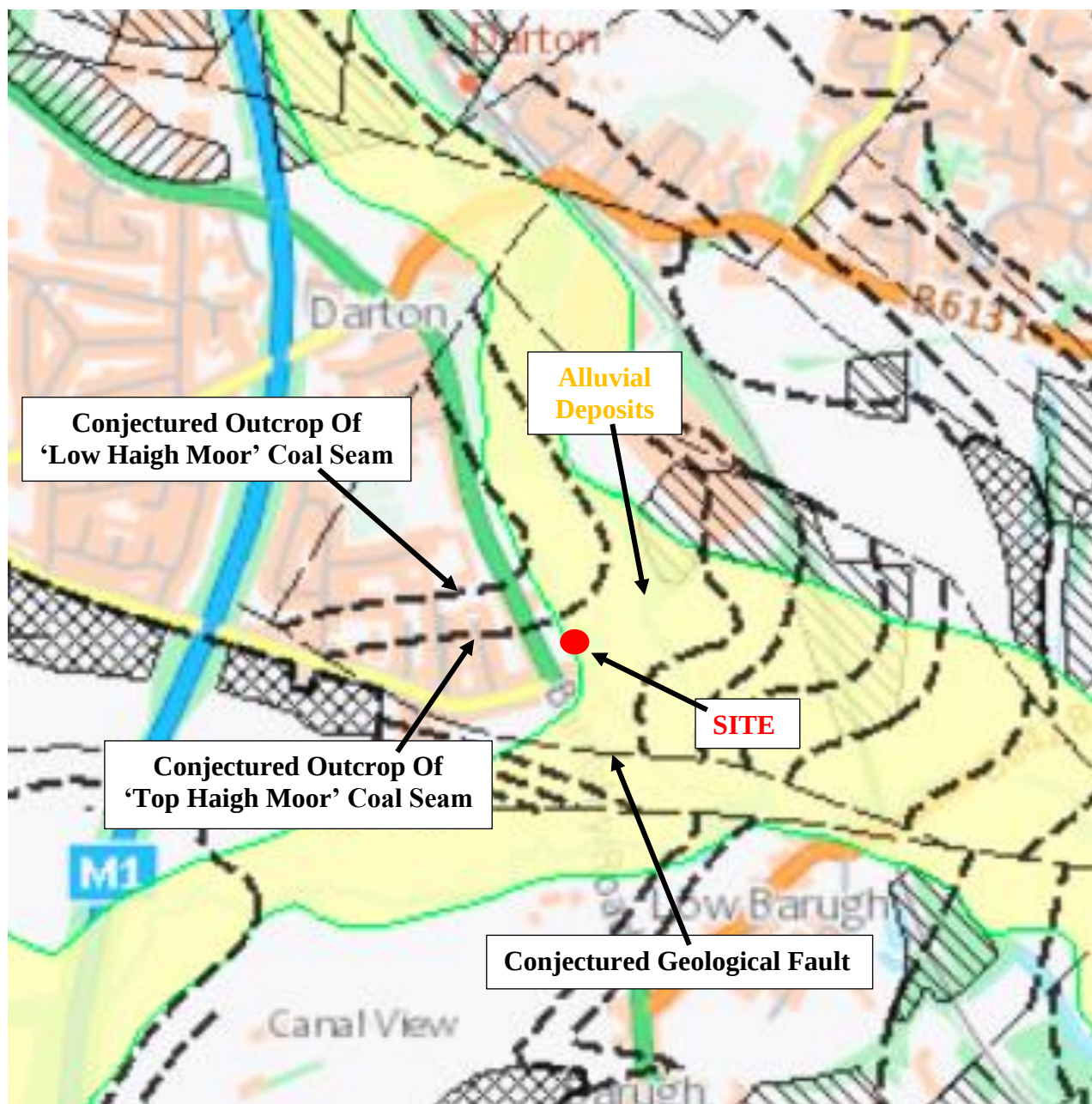
Scope of the Coal Mining Risk Assessment

The purpose of this Coal Mining Risk Assessment Report is to:

- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site;
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
- Set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any further works that may be necessary; and
- Demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to development on unstable land.

Surface Geology (inc. any superficial deposits)

Records indicate the site to be located on the Haigh Moor Rock sandstone of the Middle Coal Measure series from the Carboniferous formation. This bedrock is shown to be covered by an unknown thickness of alluvial deposits superficial deposits (clay, silt, sand and gravel) associated with the nearby river Dearne. Strata is shown to dip eastwards at a shallow rate of around 1 in 12 (5°) eastwards in this vicinity. Sandstone bedrock may contain natural fissures that could have been opened out by the past deep coal mining in the area. A summary of the surface geology is illustrated on the image below which is an extract from the BGS Onshore Interactive Viewer:



Fault Planes or Fissures

No geological faulting is shown within 50m of the site – the closest faults in the vicinity are indicated clear of the site as shown on the above image.

Coal Seam Outcrops

The Top Haigh Moor coal seam, up to around 1.1m in thickness, is shown to outcrop some 30m away to the north-east of the site. This coal would be conjectured to be at around 4m deep beneath the site (note: as this is based on conjectured the actual position may be somewhat different).

The Low Haigh Moor coal seam, up to around 1m in thickness, is shown to outcrop some 130m away to the north-east. This coal would be conjectured to be at around 14m deep beneath the site (note: as this is based on conjectured the actual position may be somewhat different).

Made Ground

No made ground is indicated within 100m of the site.

Opencast Coal Workings.

No opencast coal operations are known within 250m of the site. A slight potential will exist for discovering in-filled ground from small scale historic ‘digging out’ of the likely shallow workable coal in this area.

Underground Coal Workings - Deep

Deep coal mining (over 50m deep) has taken place beneath the site in various coal seams, all settlement from which will be long complete. As no coalfields now exist, the site should remain stable from the deep coal mining perspective for the foreseeable future.

Underground Coal Workings - Shallow

There are no known underground workings in either the Top or Low Haigh Moor seams beneath the site itself. The seams are known to have been worked by underground methods however some 800m away to the south from the former Barugh Colliery during the early 1900’s. Abandonment plan details from these workings indicate the coal seam thicknesses for these coal seams as mentioned earlier. As such, there will be some potential for discovering old unrecorded workings beneath the site in these coal seams which are known locally to be of a viable nature (the reason why the site lies within a Coal Authority referral area – indicated as an area of ‘probable shallow

coal workings'). Having said this however, the likelihood is considered quite low given the proximity of the river combined with the overlying alluvium – which would make for drainage/flooding problems.

The common historic method of underground mining which causes development issues to present are 'pillar and stall' mining, where pillars of coal are left in tact to support the roof from collapsing. As such, the voids can remain open for many years until either the roof steadily collapses to the surface creating crown holes (sink holes), or settlement occurs as the pillars erode and crush under the weight of the strata above. Any proposed structures that increase the load on the strata will of course exacerbate these effects, if such workings are present at a shallow enough depth.

Mine Entries

According to the Coal Authorities details no mine entries are known within 250m of the site. Some potential will exist for mine entries being encountered which there are no records considering the relatively shallow coal of a workable thickness.

Fugitive Gases

As far as we are aware, no evidence of coal mining related fugitive gas emissions are known within 250m of the site. However, there will be some risk for associated gases in relation to the relatively shallow coal (more so if any unrecorded workings exist).

Historical Records

According to the historical records, no nearby indications of any mining or quarrying activities are noted within the site itself.

Coal Mining Risk Assessment (based on the above).

Coal Seam / Coal Mining Issue	Risk Assessment (VeryHigh/High/Moderate/Low/VeryLow)
Underground coal mining (at shallow depths)	Low to Moderate
Mine entries (shafts and adits)	Low
Geological faulting	Low
Geological fissures	Moderate
Fugitive gas emissions	Moderate to Low
Surface mining (opencast workings)	Low
Aggressive ground	Low to Moderate
Coal exposed / near foundation level	Moderate

Defined Risk Assessment

(Where 'Underground Coal Mining' above = Very High to Moderate)

Extent of known underground mining in this/these shallow coal seam/s in the wider vicinity	(Extensive / Much / Occasional / None Known) Much to Occasional
Intrusive Site Investigation of Coal Seam / Mines of Coal (given nature of proposals).	(Required / Recommended / Unnecessary)** Recommended
Advised critical depth beneath foundation level to investigate considering geology and nature of the shallow coal/s*	20m

Key:

* The critical depth is calculated according to Ciria C758D guidance which details that for the land to be regarded as stable from any voided mineworkings, then a suitable section of competent rock cover above the workings should be proved that is equal or greater than ten times the 'in-tact' coal seam thickness. The advised critical depth to investigate to in this report takes into account the available geological information, any nearby mining records and may include a contingency for the seam to be of a slightly greater thickness than anticipated. Due care and diligence should be employed on-site to ensure that sound information is gathered of the in-tact seam thickness, particularly if concluding that old workings are outside the critical depth of affecting stability for the proposed development.

** Where :

Required	Intrusive Site Investigation required of the shallow coal/s and/or mine entries to determine any necessary stabilisation works for the given development.
Recommended	Intrusive Site investigation recommended – given a lower level of risk in relation to the nature of proposed development some proposals may reduce the risk to an acceptable level via suitable design considerations.
Unnecessary	Intrusive Site Investigation deemed unnecessary – given geological/mining information.

Coal Authority

Prior written permission from The Coal Authority is required for intrusive activities which will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). Further information on The Coal Authority's permissions process can be found at:

www.coal.gov.uk/services/permissions/index.cfm

Information sources:

- *British Geological Survey Map Sheet SE 30 NW 1980 Edition*
- *British Geological Survey – Geology Of Britain Viewer*
- *Coal Authority Interactive Viewer and Mine Abandonment Plans*
- *Historical Mapping – old-maps.co.uk*

CONCLUSIONS

- 1) The site can be regarded as stable from the **Deep Coal Mining** perspective, and as no coal fields now remain this position should continue for the foreseeable future.
- 2) Given the **Shallow Coal Mining** position in relation to the scale/nature of development (relatively small-scale lightweight development combined with low to moderate risk of shallow mine workings), although an intrusive mining investigation would ultimately prove stability for the development, a somewhat strengthened foundation design solution alone may be a more pragmatic and balanced approach. Structurally engineered designs (such as a pad/raft for example designed to span a 3m soft spot for the specific loading) should be approved by the local authority and Coal Authority prior to development in this instance. In the case of an intrusive investigation however (which may be required for warranty purposes), 2 to 4 holes to check the nature of the shallow Top & Low Haigh Moor coal seams would be adequate to establish stability for the site – a guide to a recommended site investigation process is outlined in appendix 2. ***Note - a prior permit from the Coal Authority should be secured to enable such an investigation.***
- 3) Any coal exposed at the surface beneath surface soils will require appropriate considerations for removal and blinding off to help prevent chemical attack on foundations and reduce the risk of spontaneous combustion risks.

- 4) In terms of the fugitive mine gas risks from the potential shallow coal, the only way to prove whether protection measures are or aren't required would be for a period of gas monitoring via boreholes and stand pipes, usually undertaken over a period of 6 to 12 months. Without this investigation it may be a more pragmatic and balanced solution given the scale/nature of development, to include gas protection measures within foundation design. A methane membrane and/or a positive ventilation layer could achieve this. All usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place.
- 5) Although being a relatively low risk, a watching brief should be employed during future grounds works for any signs of unrecorded mine entries. Circular areas of grey fill within bedrock would be an indication. If suspected the Coal Authority (as owners) should be notified immediately for appropriate deliberations.
- 6) A watching brief would also be recommended for any signs of opened out fissures should sandstone bedrock be proved beneath the alluvium or topsoil. Associated ground treatment works may be required to stabilise any such features prior to foundation works.

A suitably qualified and competent professional should be employed to use this report to determine the conditions on site, and ultimately advise on what action, if any, is necessary to safeguard the development. Further guidance on site investigations, treatment works and foundation designs can be found via the CIRIA C758D document 'Abandoned Mine Workings Manual.' It should be noted that any future works to investigate any coal seam, mines of coal or associated mine entries will need the prior consent of the Coal Authority via their permitting procedure.

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

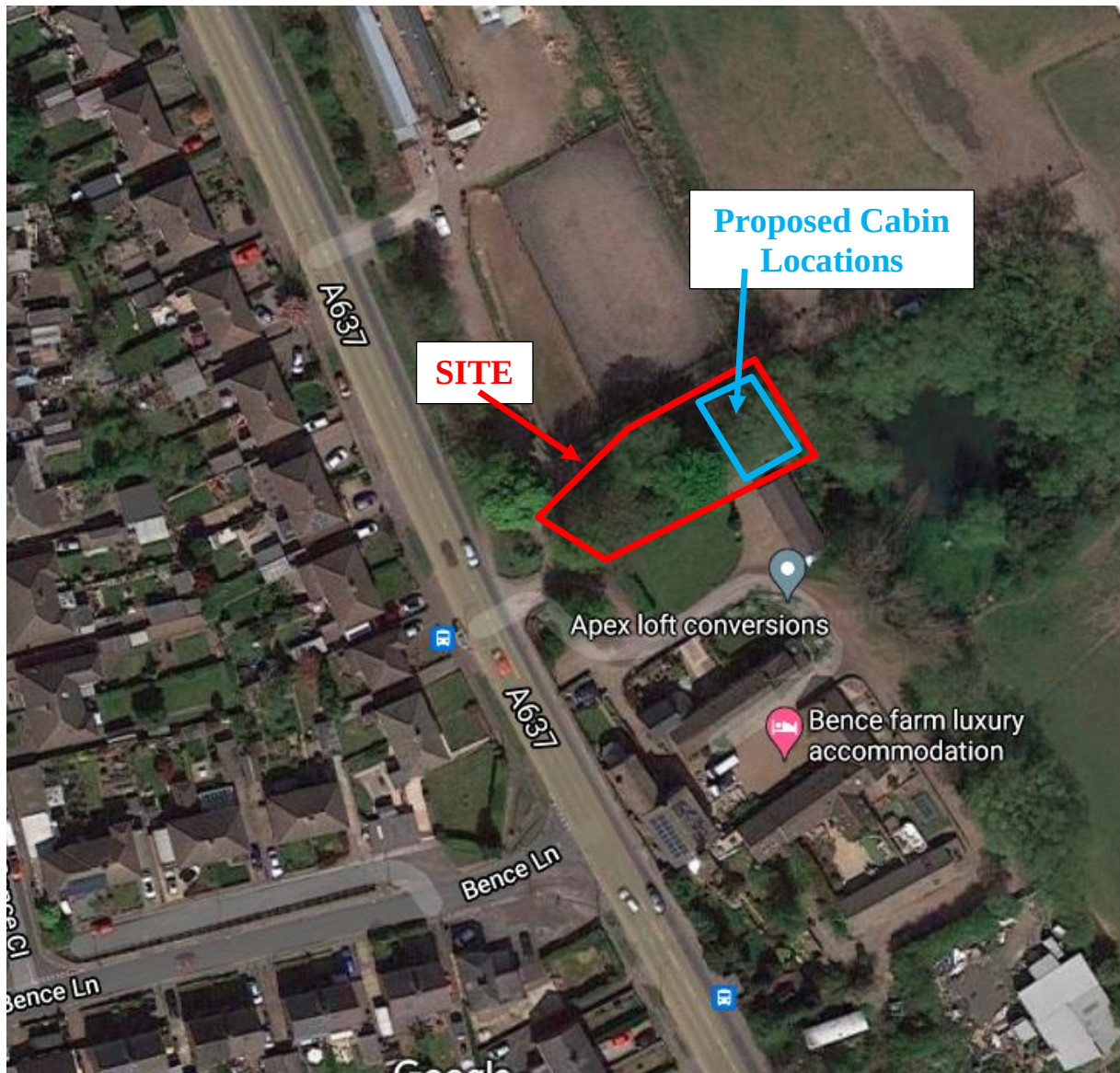
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THIS COAL MINING RISK ASSESSMENT IS BASED ON AND LIMITED TO THE INFORMATION IN MY RECORD AT THE TIME THE ENQUIRY IS ANSWERED. It is based on my professional opinion in line with the guidelines set out in CIRIA C758D "Abandoned mine workings manual." The opinion may be overruled by Government Authorities decisions based on other information not in my record. If a site investigation is recommended then this risk assessment will be superseded by the factual findings of that investigation. All site investigation work should be carried out by a competent professional from which independent conclusions and recommendations for safe development should be provided. It should be noted that: no operation should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. The investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases; these risks both under and adjacent the site should be fully considered in any proposals both for personnel and public safety. Copyright in this CMRA 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.

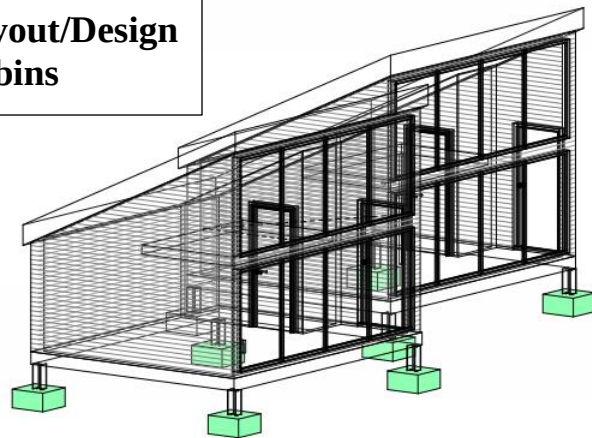
Appendix 1 – Location Plan No. 002601A

(Not To Scale)

Site centred at OS NGR 431325 / 409318



**Proposed Layout/Design
of Cabins**



Appendix 2

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

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