

**Mr. P. Thompson
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**LYONS CMC
COAL MINING & GEOTECHNICAL
CONSULTANCY**

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Date: 5th May 2022
Your ref: (S71 4RF).
My Ref: CMRA 00294

FOR THE ATTENTION OF MR PETER THOMPSON

Dear Sir,

**COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED RESIDENTIAL
DEVELOPMENT AT LAND ADJACENT 34 HIGH STREET, ROYSTON, BARNSLEY S71 4RF**

Introduction

Planning permission is being sought for a pair of semi-detached dwellings and garages at the above named site, the location of which can be seen on the attached plan No. 002934A in Appendix 1. The site is centred around national grid reference E: 436002 / N: 411364. 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.

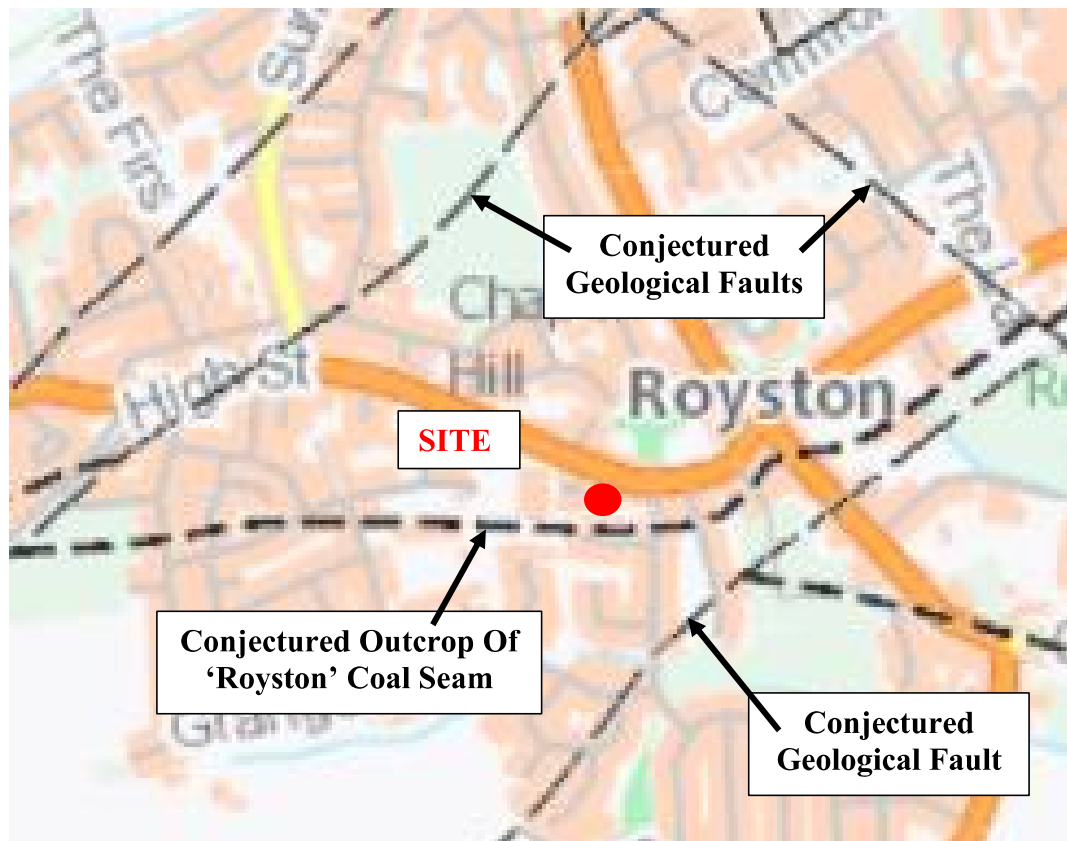
Scope of the Coal Mining Risk Assessment

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 shales, mudstones and possibly the 'Mexbrough Rock' sandstone of the Middle Coal Measure series from the Carboniferous formation. No superficial deposits are indicated in the vicinity of the site itself. Strata is shown to dip towards the NNE (north-north-east) at around 5° (1 in 10) in this vicinity. 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

A geological fault is conjectured to pass the site in a SW to NE trend over 100m away clear of the site as shown to the south-east; with other conjectured faults further away to the north-west and north-east as indicated. Although no fissuring of bedrock is known in the vicinity, the likelihood of natural sandstone fissures that could have been opened out by the past deep coal mining in the area should not be precluded.

Coal Seam Outcrops

As outlined on the extract image above from the BGS Onshore Interactive Viewer, the 'Royston' coal seam is conjectured to outcrop some 30m away to the south of the proposed development area. This seam will dip beneath the site and be present at circa 4m deep should the conjectured information be accurate. Local information suggests a seam thickness for the Royston seam in the region of 0.8m (the nearby former New Monkton Colliery shaft section details the seam as 2ft 6in – described as 'stone and coal', which infers that it was of poor quality).

Made Ground

No made ground is shown in the vicinity of the site.

Opencast Coal Workings.

No opencast coal operations are known within 250m of the site. A slight potential will exist for very historic small scale 'digging out' of shallow coal, given the conjectured geological position. An element of backfill may be an indication of such, if encountered during future ground works.

Underground Coal Workings - Deep

Deep coal mining (over 30m 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

According to Coal Authority details the site lies in an area of 'probable shallow workings'. This will relate to the 'Royston' coal seam, which infers that although no known workings of this seam are recorded, the likelihood of unrecorded, possibly illicit, workings should not be precluded. At anticipated depths, any such old mining voids, if present, may compromise the stability of the development. In this instance, according to the CIRIA C758D (Abandoned mine workings manual), around 8m of natural strata above the seam and to the base of formation level would be required for it to be regarded as stable be it worked or otherwise. However, only 'occasional' knowledge is known of associated underground workings in this seam in the Barnsley area as a whole, therefore it is considered a moderate to low risk. No other coal seams are anticipated at an influencing depth below the Royston seam.

Mine Entries

No known mine entries are indicated within 100m of the site. Some potential will exist however for mine entries being encountered of which there are no records considering the shallow workable coal seam.

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 shallow workable coal. These risks will be greater should any shallow workings be proved and far greater should any unrecorded mine entries be discovered within the site.

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)	Moderate to Low
Mine entries (shafts and adits)	Moderate to Low
Geological faulting	Low
Geological fissures	Moderate
Fugitive gas emissions	Low to Moderate
Surface mining (opencast workings)	Low
Aggressive ground	Moderate
Coal exposed / near foundation level	Low to 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) Occasional
Intrusive Site Investigation of Coal Seam / Mines of Coal (given nature of proposals).	(Required / Recommended / Unnecessary)** Required
Advised critical depth beneath foundation level to investigate considering geology and nature of the shallow coal/s*	15m

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 :*

<i>Required</i>	<i>Intrusive Site Investigation required of the shallow coal/s and/or mine entries to determine any necessary stabilisation works for the given development.</i>
<i>Recommended</i>	<i>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.</i>
<i>Unnecessary</i>	<i>Intrusive Site Investigation deemed unnecessary – given geological/mining information.</i>

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 31 SE 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 a limited borehole site investigation would be recommended to determine the depth and nature of the anticipated Royston coal seam which may be at a shallow depth. This may not be required however if any evidence of this coal is experienced beneath the surface soils and verified by a suitably qualified mining/geotechnical engineer. No coal seam will need to be investigated beneath the Royston seam, therefore if it can be concluded that the coal at the surface is very likely to be the Royston seam then no boreholes would be necessary. Failing this, 3 to 5 boreholes to maximum depths of 15m (beneath bedrock/formation levels) would ultimately prove the presence or otherwise of the coal, along with any associated workings of which there are no records, if present. Any voids encountered may require further design/ground work considerations for safe development.

A guide to a recommended site investigation process is outlined in appendix 2; CIRIA C758D 'Abandoned Mine Working Manual' guidance should be followed. A permit from the Coal Authority should be secured to enable such an investigation. Water flush drilling methods would be required to mitigate from fugitive gas risks.

- 3) Any coal exposed at the surface beneath surface soils/clays 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 3 to 6 months. Without this investigation it may be a more pragmatic solution to include gas protection measures (such as a methane membrane and/or positive ventilation layers) within future foundation designs in any case. All usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place.
- 5) A watching brief should be employed during future grounds works for any signs of unrecorded mine entries. A site scrape to natural ground is the most effective procedure to check for such features; 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 similar watching brief should be employed during future ground works for any signs of made ground (that may be associated with small scale ‘digging’ out of shallow coal), geological faulting and/or any opened out fissures in sandstone bedrock. Appropriate foundation design considerations may be required.

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.

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. 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,

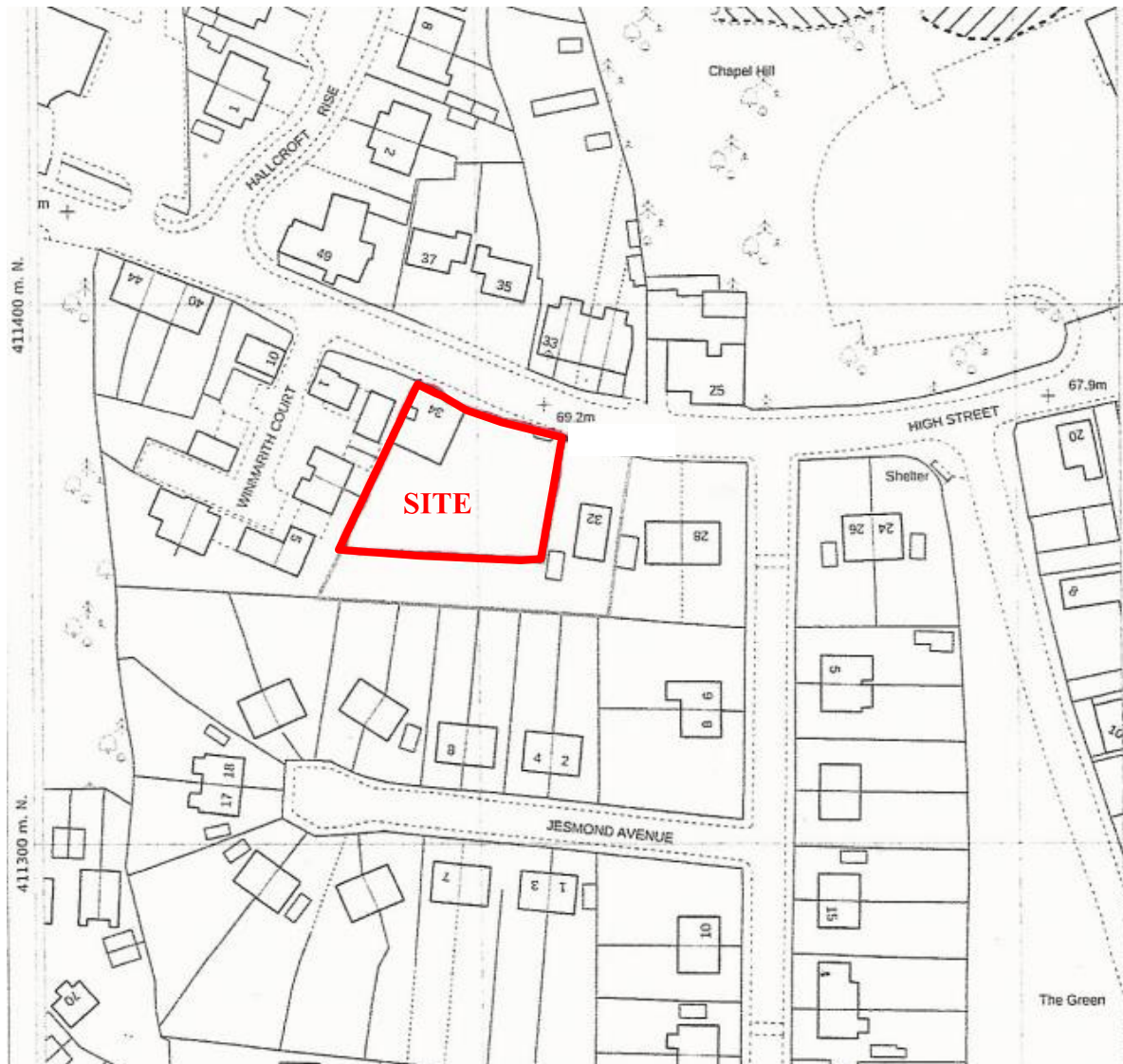
M Lyons

M. Lyons
Consultant Mining Engineer
BSc CSci MIMMM

Enc.

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. 00294/A
(Not To Scale)
Site centred at O.S. 436002 / 411365



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

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