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**LYONS CMC
COAL MINING & GEOTECHNICAL
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Date: 12th October 2020
Your ref: (S63 9LG).
My Ref: CMRA 00241

FOR THE ATTENTION OF DAVID WROE

Dear Sir,

**COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED RESIDENTIAL
DEVELOPMENT AT LAND AT BARNSELY ROAD, GOLDTHORPE, ROTHERHAM S63 9LG**

Introduction

Planning permission is being sought for residential development on approximately 1.1 hectares at the above named site, the location of which can be seen on the attached plan No. 00241/A in Appendix 1. The site is centred around national grid reference E: 445037 / N: 404280. 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 Local Authority.

Scope of the Coal Mining Risk Assessment

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

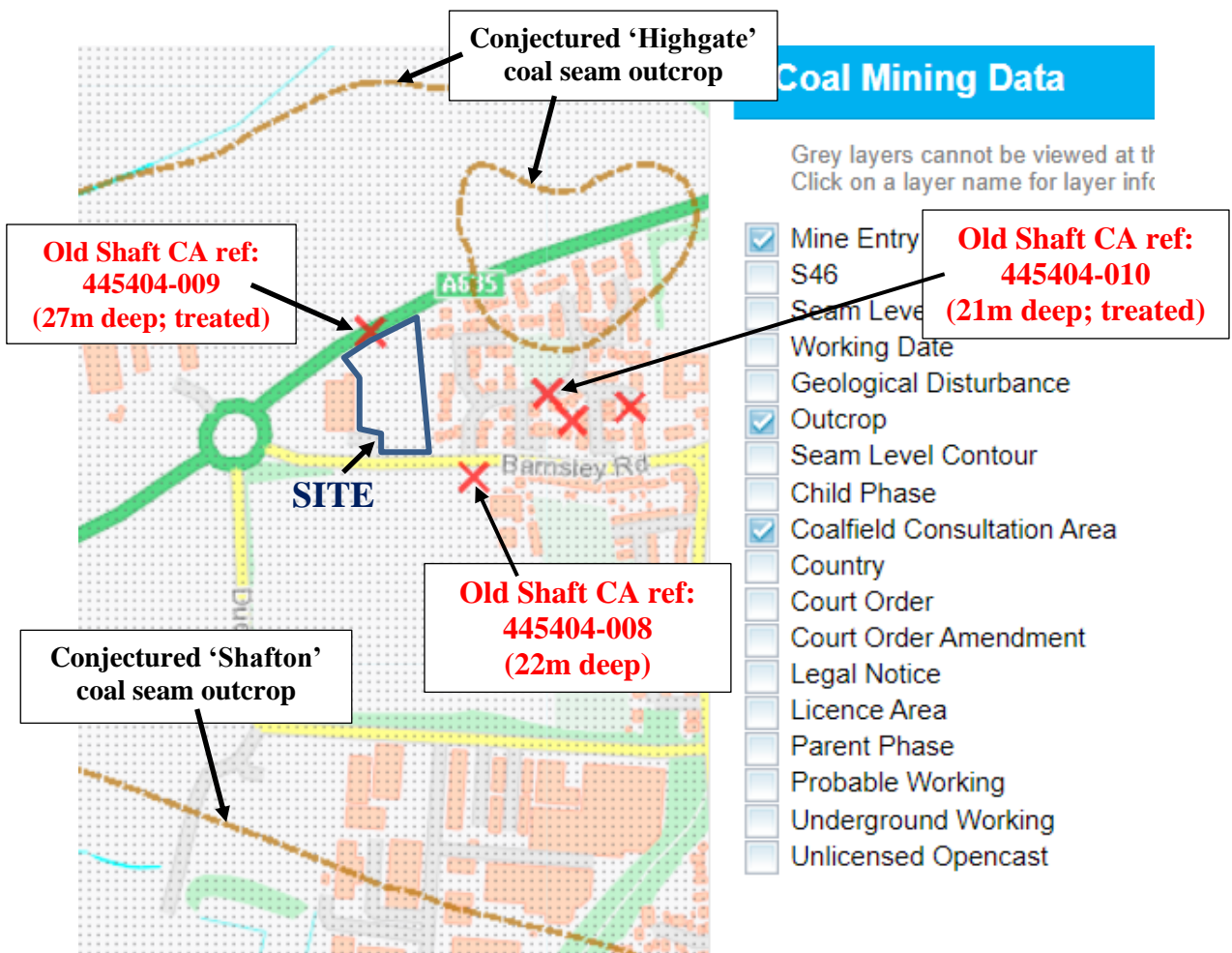
- Present a desk-based review of all available information on the coal mining issues which are relevant to the application site;
- Use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
- Set out appropriate 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 sandstones of the Middle Coal Measure series from the Carboniferous formation. No superficial deposits are indicated in this vicinity.

Coal Seam Outcrops

As outlined on the extract image below from the Coal Authorities Interactive Viewer, the ‘Shafton’ coal seam is conjectured to outcrop some 300m away to the south of the site which dips northwards and beneath the proposed development. Local mining records indicates that the Shafton seam is of around 1.5m thickness in this vicinity. The ‘Highgate’ coal seam is shown to outcrop some 70m to the north-east (a circular ‘in-layer’ formation) and also around 290m to the north. Dipping to the north/north-east the Highgate coal should not be present beneath the site. A small potential may exist however for the seam, or part of it, being encountered beneath surface soils in the north-eastern extremity. No other workable coal seams are anticipated at an influencing depth (from a shallow mining stability aspect) below the Shafton coal.



Made Ground

No made ground is indicated in the vicinity.

Fault Planes or Fissures

No geological faulting is known in the vicinity of the site and no records of any fissures are evident either. Some potential will exist however for fissures being encountered within sandstone bedrock considering the past deep coal mining in the area.

Opencast Coal Workings.

None known within the site itself; the Highgate coal 'in-layer', some 70m to the north-east, was worked via opencast methods as indicated on the above image. The Shafton seam has been quite extensively worked via opencast methods in the wider vicinity westwards.

Underground Coal Workings - Deep

Deep coal mining (over 30m deep) has taken place beneath this area in several coal seams in the past; all associated settlement will be long complete and as no coalfields now exist, the site should remain stable from the deep coal mining perspective for the foreseeable future.

Underground Coal Workings - Shallow

Although no known underground shallow workings are known beneath the site itself in the Shafton seam, it is known to have been worked via underground methods in the wider vicinity. Indeed Barnsley local authority are aware of unrecorded shallow workings directly to the south of Barnsley road to Commercial road where the seam outcrops. There will therefore be some potential for further unrecorded workings of this coal being present beneath the site. The general rule of thumb from CIRIA C758D (Abandoned mine workings manual) guidelines is that a site would need ten times the coal seam section of competent natural strata beneath the formation level and top of the coal for it to be considered as stable whether worked or otherwise. Reliable information is present to predict the Shafton seam at around 22m deep in the southern part of this site, to around 27m deep in the north. Given that any unrecorded workings are most likely to be pillar and stall methods which would not have involved substantial roadways, it is very unlikely that any remaining mining voids would compromise surface stability for the development – providing that bedrock is within 1m to 2m of the surface (i.e there are no substantial areas of made ground or superficial deposits).

Mine Entries

No mine entries are known within the site itself. However, as can be seen in the extract image above, various are known in the surrounding vicinity, which are as follows (in order of closeness to site):

Mine Shaft Coal Authority Ref: 445404-009; beneath highway adjacent to north; indicated as 27m deep and treated.

Mine Shaft Coal Authority Ref: 445404-008; some 55m south-east; indicated as 22m deep but not shown to be treated.

Mine Shaft Coal Authority Ref: 445404-010; some 140m east; indicated as 21m deep and treated.

These mine shafts will have accessed the Shafton coal seam which their depths will correspond to. Some potential will exist for other mine shafts or adits being encountered which there are no records.

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 coal, particularly if worked and more so should any fissured sandstone bedrock be present.

Historical Records

According to the historical records for this site, no nearby indications of any mining or quarrying activities are noted 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)	Low to Moderate
Mine entries (shafts and adits)	Moderate
Geological faulting	Low
Geological fissures	Moderate
Fugitive gas emissions	Low to Moderate
Surface mining (opencast workings)	Low
Aggressive ground	Low
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) Much
Intrusive Site Investigation of Coal Seam / Mines of Coal (given nature of proposals).	(Required / Recommended / Unnecessary)** Unnecessary
Advised critical depth beneath foundation level to investigate considering geology and nature of the shallow coal/s*	N/A

Key:

* *The critical depth is calculated according to Ciria Publication 32 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	<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>
Recommended	<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>
Unnecessary	<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 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) Although relatively shallow coal workings may be present in the Shafton coal seam beneath the site, the seam is calculated to be at a depth (circa 20m or more) that should not cause a stability issue to the proposed development be it worked or otherwise – in line with best practice as detailed in CIRIA C758D 'Abandoned mine workings manual'. However, this would be on the proviso that there are no substantial areas of made ground or superficial material, which would make for a lower formation level and thus decrease the cover above any potential voids. A series of trenches across the site should conclude this, and if bedrock is relatively shallow then no further intrusive borehole investigations would be thought necessary regarding the shallow coal mining position. This of course may need to be re-thought should any substantial made ground/superficial deposits be encountered.
- 3) A small potential exists for discovering coal at the surface in the north-eastern part of the site which would be the Highgate coal seam. Trenching again in this area would be prudent to determine any areas that will require coal removal and blinding off techniques to help prevent spontaneous combustion risks and chemical attack risks.
- 4) 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.

- 5) A watching brief should be employed for any signs of weak/fissured sandstone bedrock with appropriate ground treatment works and/or strengthened foundations adopted as necessary.
- 6) Considering the relatively shallow coal, coal workings and nearby mine entries, usual safety precautions should be employed regarding possible fugitive gases in any deep excavation work taking place. Mitigation measures may also be required within foundation design, such as a methane membrane or positive ventilation.

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 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 Special Publication 32 - "Construction Over Abandoned Mine Workings." 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. 00241/A
(Not To Scale)
Site centred at O.S. 445037 / 404280

