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Date: 14th April 2022
Your ref: (S75 3AR).
My Ref: CMRA 00292

FOR THE ATTENTION OF MR ROBERT AGUS

Dear Sir,

**COAL MINING RISK ASSESSMENT (CMRA) - FOR PROPOSED NEW DWELLING AT THE
GATE INN, CHAPEL ROAD, PILLEY, BARNSELY S75 3AR**

Introduction

Planning permission is being sought for a detached dwelling at the above named site, the location of which can be seen on the attached plan No. 00292/A in Appendix 1. The site is centred around national grid reference E: 433358 / N: 400706. 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.

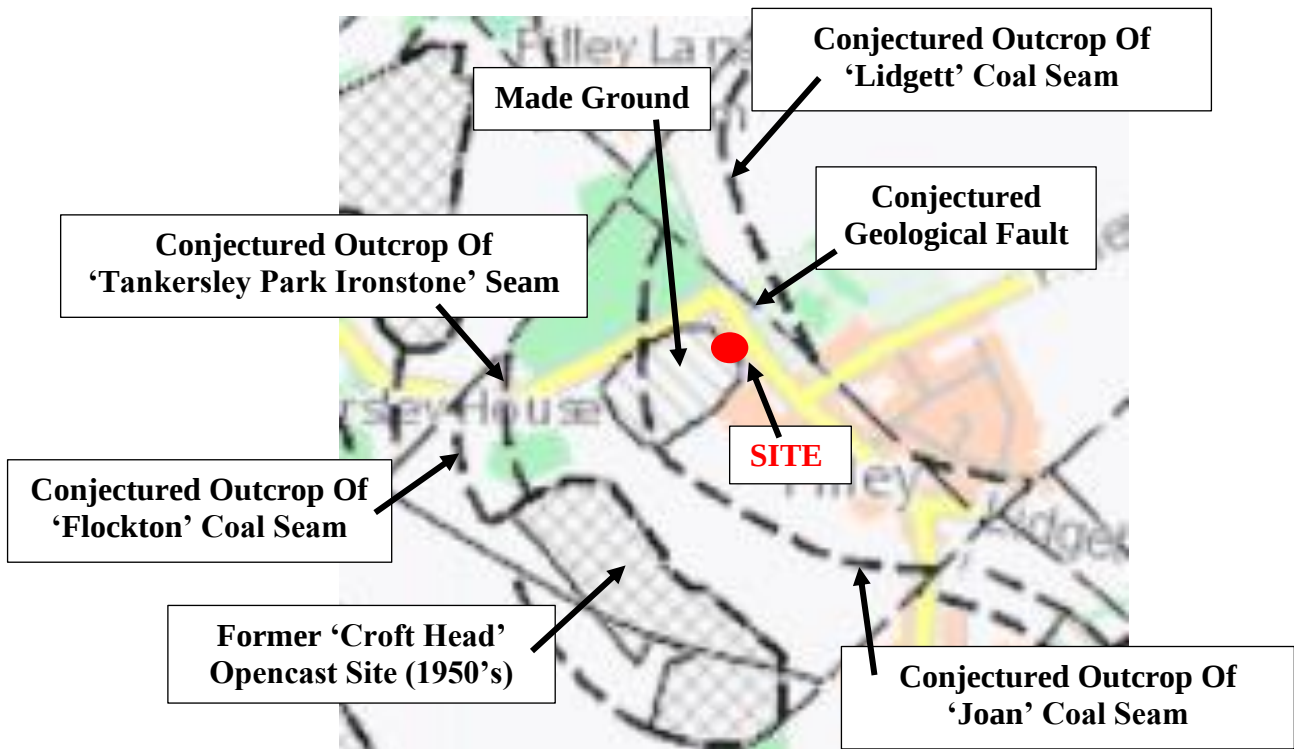
Scope of the Coal Mining Risk Assessment

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 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 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 known as the 'Tannersley Fault' is conjectured to pass the site in a NW to SE trend some 30m to the north-east of the site as shown. This fault throws the strata down by around 40m to the north-east. The fault may consist of a single plane of fracturing or a 'zone' of various such planes in the same orientation. 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 'Lidgett' coal seam is conjectured to outcrop some 65m away to the ENE of the site – this seam will dip away clear of the site and therefore not be present at shallow depth. The 'Joan' coal seam, of

around 0.5m thickness, is conjectured to outcrop some 70m away to the west as indicted, which will dip beneath the site at conjectured depths of between 7m to 20m deep. The Tankersley Park Ironstone (TPI) seam and Flockton coal seam are shown to outcrop over 250m away to the south-west. The TPI is around 2.2m thickness and would be circa 15m below the Joan coal seam (between 22m to 35m deep beneath the site). The Flockton coal seam, of around 1.8m thickness (including two dirt bands), will lie at circa 7m below the TPI.

Made Ground

The site is shown to be partially located on an area of made ground, as indicated on the above image. It is not clear as to the origin of this material; although it is in the vicinity of 'old ironstone pits' and therefore may contain an element of associated spoil material.

Opencast Coal Workings.

The 'Croft Head' opencast site, some 200m away to the south-west as shown on the initial image, worked both the Flockton coal seam and Tankersley Park Ironstone seam; proving the Flockton coal as around 1.8m in thickness with two dirt bands of 0.2m and 0.45m.

The 'Rockley 1&2' opencast, over 600m away to the north of the site, worked the Joan coal seam at circa 0.5m thickness; records suggest that historic underground workings of this coal were encountered in the northern part of the operations (around 1km away from the site).

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

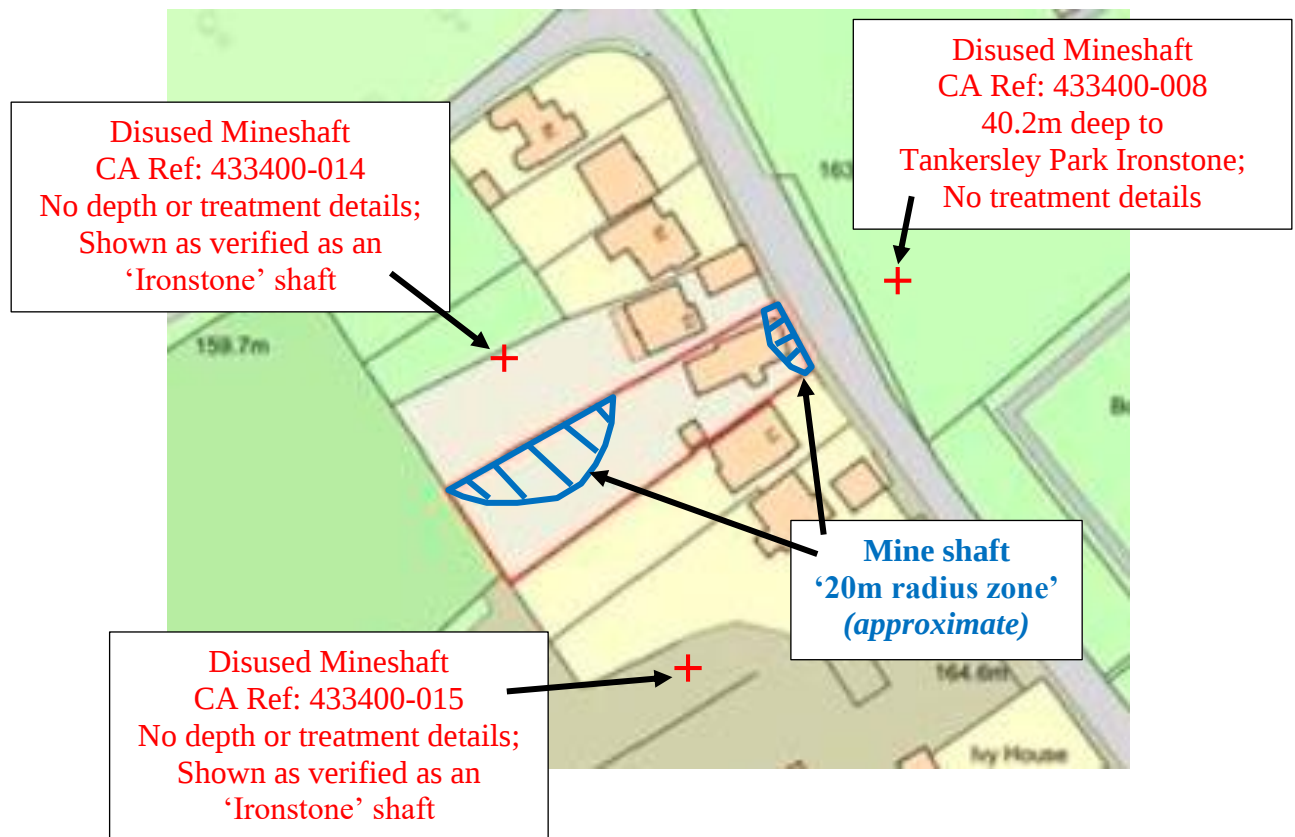
According to Coal Authority details the site lies in both an area of 'past shallow workings' and an area of 'probable shallow workings'. The past shallow workings appear to relate to known workings in the Tankersley Park Ironstone seam which are shown to encroach beneath the majority of the site; little information is shown as to actual depths of these workings. The 'probable workings' will relate to the 'Joan' 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.

Given the anticipated depth and thickness of the Tankersley Park Ironstone, and considering the guidelines as set out in CIRIA C758D 'Abandoned Mine Working Manual', it is possible that the associated workings may be too deep to affect stability for proposed development at the site; particularly in the eastern half of the site where the seams will be deepest. However, this may not

be the case if any historic mining voids are present in the higher Joan coal seam at a depth where interaction of void migration may extend to compromise surface stability; namely in the western half of the site where the seams will be shallowest.

Mine Entries

As indicated on the following image, three disused mine shafts are known adjacent the site, indicated to be related to workings of the Tankersley Park Ironstone. Given the historic nature of such records, the plan position can be somewhat different to the actual position. The Coal Authority reflect this in their 20m stand-off to allow for such a contingency in actual shaft/mine entry locations. Two of the shafts '20m radius zone' falls within the site as indicated. Some potential will also exist however for other mine entries being encountered which there are no records considering the shallow workable coal seams and ironstone.



Shaft ref: 433400-008, records the TPI at 40.2m deep and is located on the conjectured position of the Tankersley Fault line. As such, the depth to this seam beneath the site may be somewhat different depending on any displacement of strata from the shaft position.

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 and nearby mine shafts. 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
Mine entries (shafts and adits)	Moderate to High
Geological faulting	Low to Moderate
Geological fissures	Moderate
Fugitive gas emissions	Low to Moderate
Surface mining (opencast workings)	Low
Aggressive ground	Moderate
Coal exposed / near foundation level	Low

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*	30m

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	<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) Given the **Shallow Coal Mining** position, and nature of development an intrusive borehole site investigation would be required to check the depth and nature of the shallow 'Joan' coal seam and possibly the Tankersley Park Ironstone (TPI) seam/workings; namely to determine whether any treatment works of shallow mining voids and/or suitably designed foundations are required. Depending on the depth and nature of the Joan coal and TPI, the deeper Flockton coal seam may also require checking. Holes to a minimum of 30m would be recommended to fully determine stability. Given the current development layout 3 holes would be thought adequate in the outset; further holes may however be deemed necessary depending on the findings. 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) Where proposed development falls within 20m of one of the conjectured mine shaft positions then natural ground should be exposed throughout that area to fully determine that the shaft is not present (i.e. out of plan position) – however, the current development plan appears outside of these areas in which case this would not be required. Should the position change so that it is required, then the Coal Authority will request evidence of such from a suitably qualified person in line with their statutory consultee procedure.

A similar watching brief should also be employed during future grounds works throughout the site as a whole for any signs of 'other' unrecorded mine entries, be they coal related or ironstone. 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 any mine entry is suspected then Coal Authority should be notified immediately for appropriate deliberations.

- 4) Any made ground at the surface will require appropriate considerations for removal and blinding off to help prevent chemical attack on foundations and reduce the spontaneous combustion risks should it contain an element of coal/colliery spoil.
- 5) In terms of the fugitive mine gas risks from the potential shallow coal/workings, spoil material and nearby mine entries 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.

- 6) A similar watching brief should be employed during future grounds works for any signs of geological faulting or opened out fissures of 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,

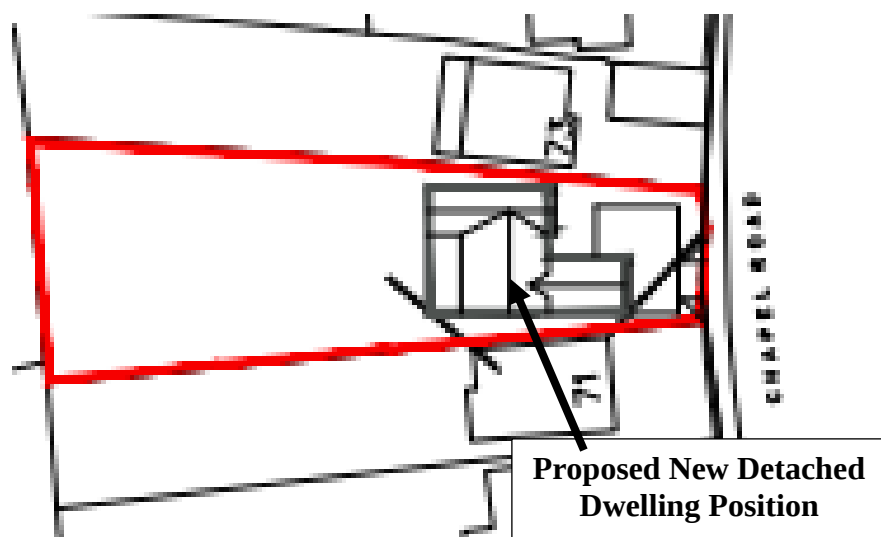
M Lyons

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. 00292/A
(Not To Scale)
Site centred at O.S. 433358 / 400706



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

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