COAL MINING RISK ASSESSMENT

AT

WINDMILL FARM
1 BUSKER LANE, SKELMANTHORPE

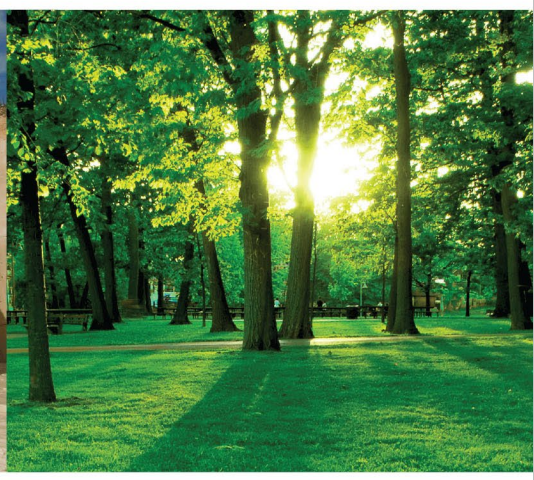
FOR

MRS H HAIGH

REPORT REF: MHH 3492

Engineering Geologists and Environmental Scientists





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ASHTON BENNETT CONSULTANCY

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May 2022

Ashton Bennett

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1. INTRODUCTION

This report describes the results of a Coal Mining Risk Assessment undertaken at Windmill Farm, 1 Busker Lane, Skelmanthorpe, HD8 9EP. The work was commission by Alan Davies of Northern Design Partnership on behalf of their client Mrs H Haigh. The assessment was carried out by this Consultancy, the Ashton Bennett Consultancy.

The purpose of this Coal Mining Risk Assessment was to assess the risk of past shallow and deep underground coal mining and mine shafts being present beneath or within influencing distance of the site. It is proposed to build a detached residential dwelling. The coal mining risk assessment comprised the collation and assessment of available information on the site including geological and mining maps, topographical maps, available borehole records and a Coal Authority Report.

This report describes the research work carried out, presents the results of the Coal Mining Risk Assessment (CMRA) and assesses the risk to the site stability from deep and shallow underground coal mining and disused mine shafts and adits.

2. THE SITE

The site lies to the south east of Huddersfield Town Centre and north west of Barnsley Town Centre, west of Wakefield Road, the A636 in the Village of Skelmanthorpe. Access to the site area is gained from the entrance to Windmill Farm from Busker Lane to the immediate south of site.

The site is occupied by a menage with residential buildings surrounding and Windmill Farm to the immediate west.

The site is bounded to the north of site by shrubs and fields. The site is bounded to the east by shrubs and trees with a residential property beyond. The site is bounded to the west by trees and shrubs with Windmill Farm building beyond. The site is bounded to the south by the A636 Wakefield Road with residential and commercial property beyond.

The site is centered at National Grid Reference 424107^{E} 410360^{N} at a height of approximately 165m above Ordnance Datum. The red line denotes the site area shown in Figure 2A and 2B.

A Site Location Plan is presented as Figure 1 and a Detailed Site Location Plan as Figure 2A, a Proposed Site Plan is Figure 2B. A Bedrock Geology Plan as Figure 3 and A Detailed Coal Seam Geology Plan is presented as Figure 4. A BGS Borehole Location Plan is presented as Figure 5. A Plan of High Risk Development Areas is shown on Figure 6. A Surface Mining Past and Present is presented on Figure 7 and Past Shallow Coal Mine Workings as Figure 8. Areas of Probable Shallow Coal Mining are presented on Figure 9. Plan of Coal Seams are shown on Figure 10 with a Plan of Mine Shafts as Figure 11.

The Coal Authority Report is presented in Appendix A.

Figure 1 Site Location Plan

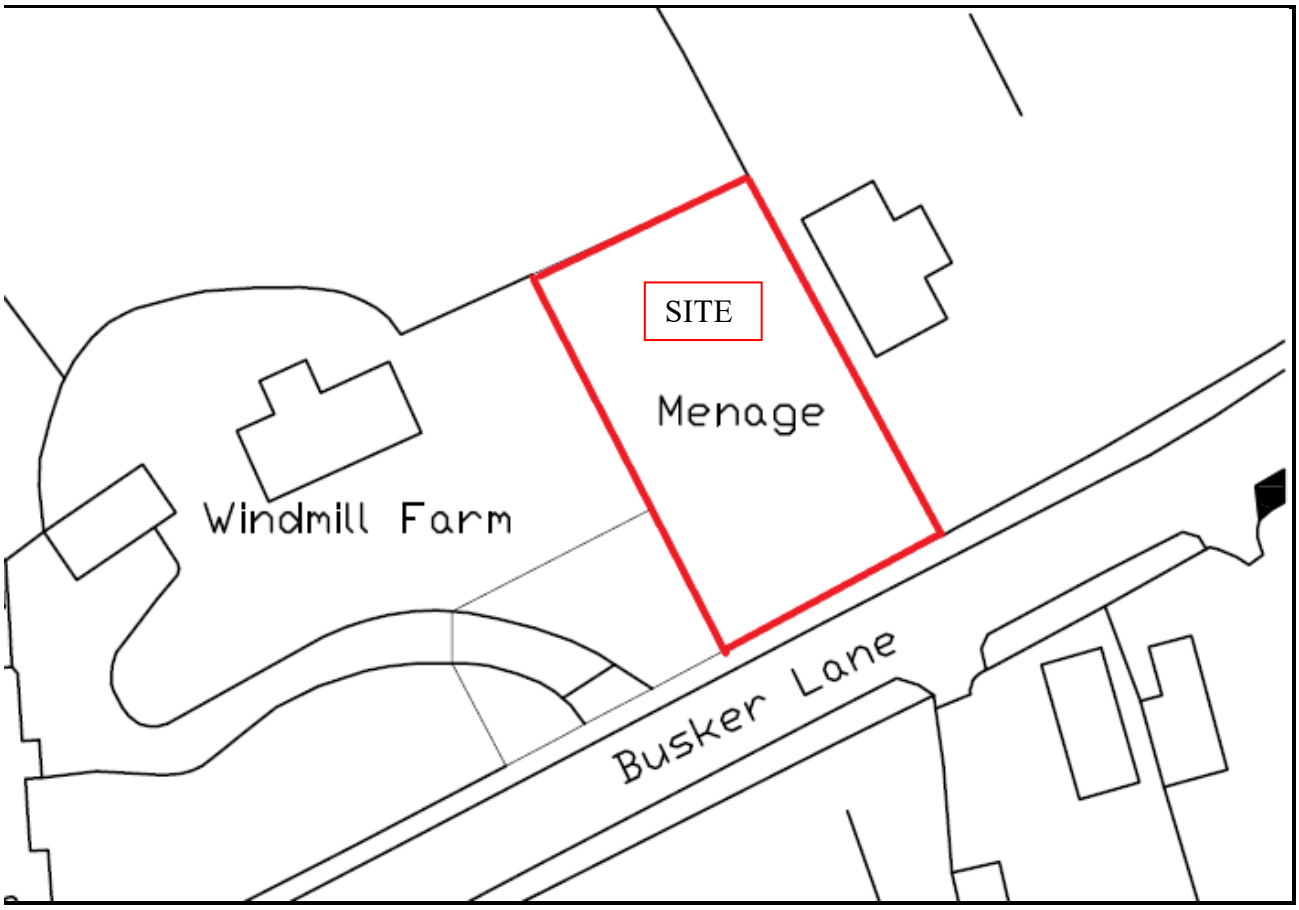


Figure 2A Detailed Site Location Plan

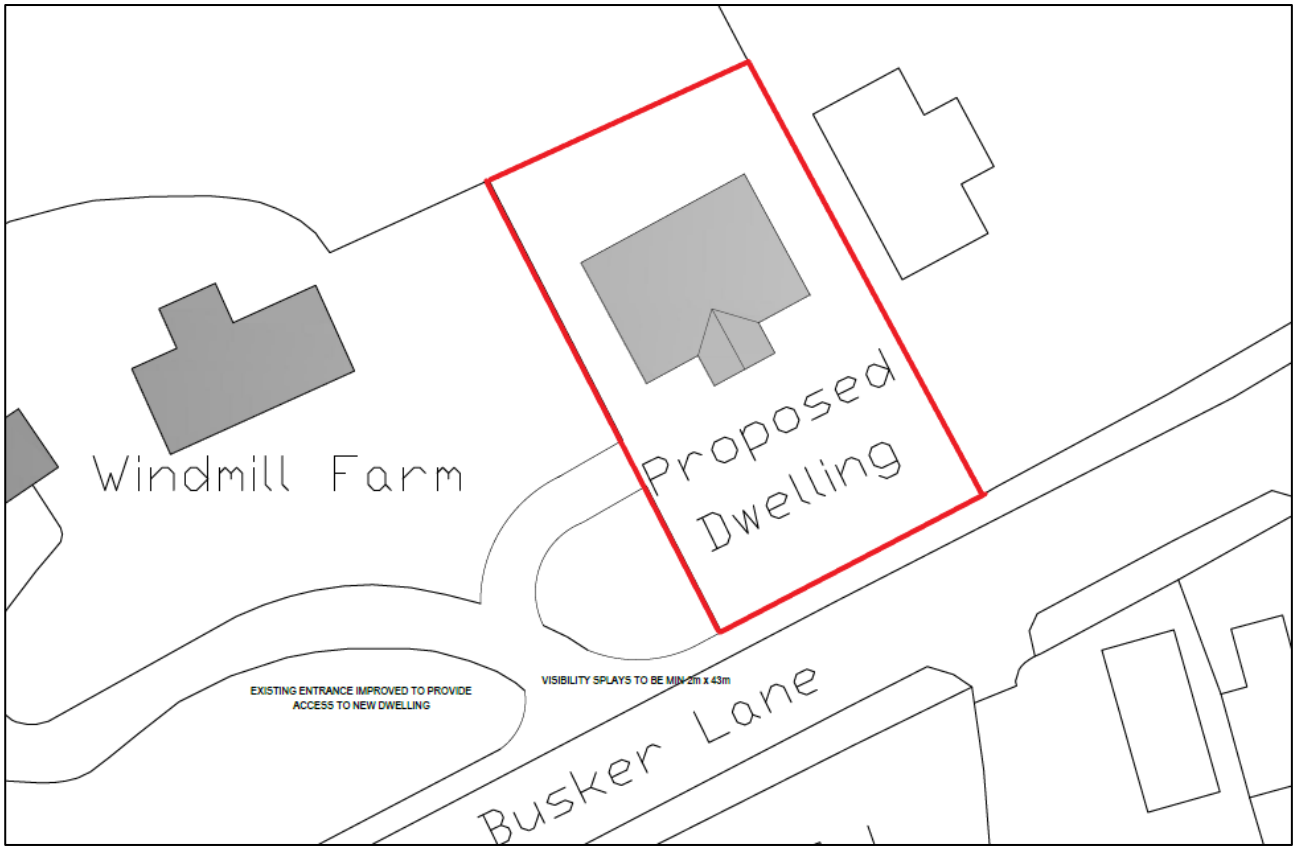


Figure 2B Proposed Site Plan

3. REPORT OBJECTIVE AND REPORT SCOPE

The objective of this Coal Mining Risk Assessment (CMRA) desk study is to examine the topographical, geological and mining data readily available for the site and determine the risk to the proposed development from past deep and shallow underground coal mining and disused mine shafts and adits.

In addition to the above this study has used the extensive knowledge and experience of the staff of Ashton Bennett Consultancy to assess the data and to interpret the data findings.

4. SITE GEOLOGY

4.1 Geology

The published British Geological Survey (BGS) maps at a scale of 1:10,000 show the site area to be underlain by the Pennine Lower Coal Measures, Westphalian A strata, consisting of fine grained sandstone, mudstone and siltstone and interbedded coal seams of the Upper Carboniferous Period. The strata immediately beneath the site consists of mudstone underlain by sandstone with coal seams at depth.

A Detailed Plan of the bedrock geology is presented in Figure 3.

The bedrock is not overlain by superficial deposits beneath the site area. Made ground may be present due to the sites former use as a menage.

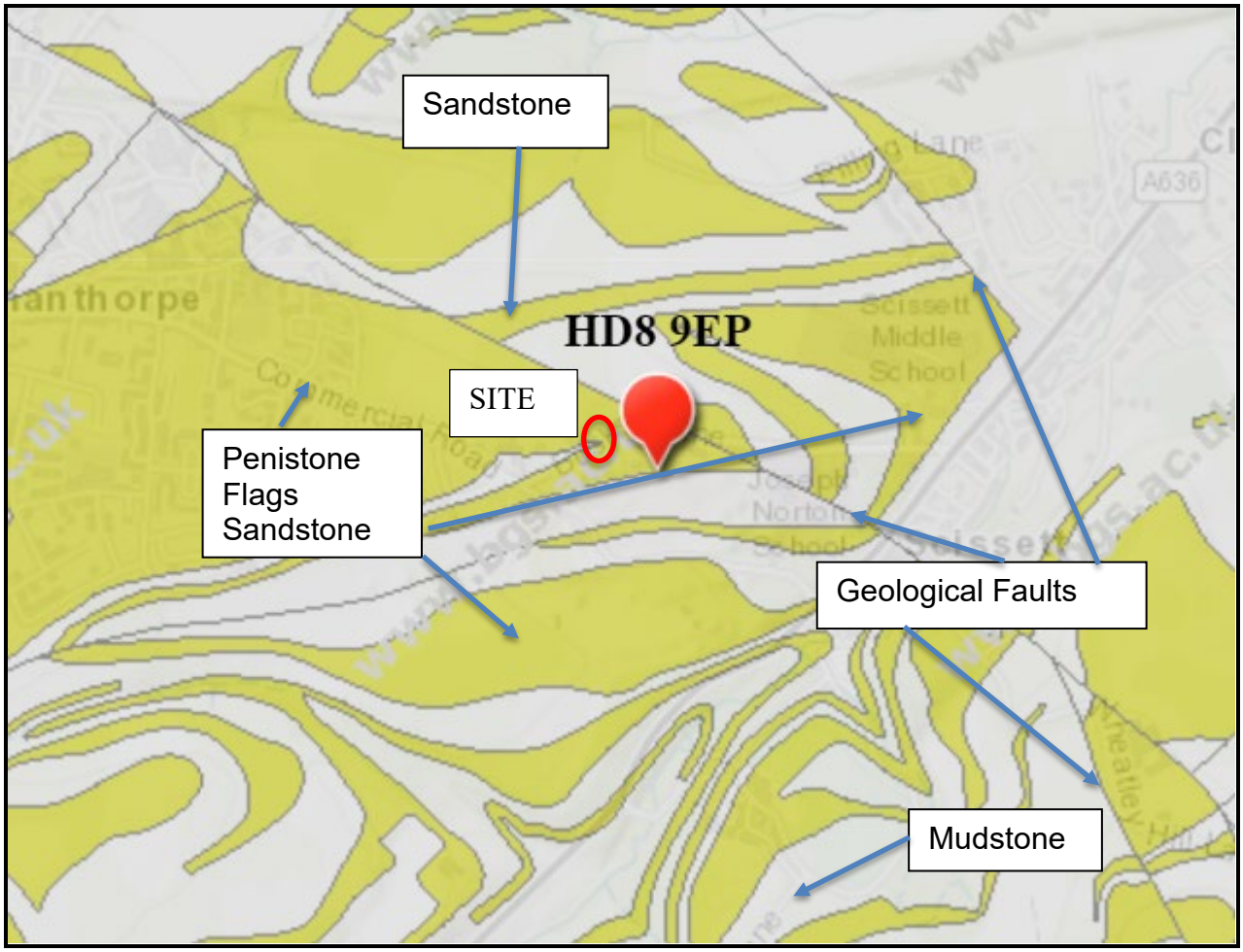


Figure 3 Bedrock Geological Plan

The sequence of strata beneath the site is presented in Table 1 although it is difficult to precisely predict the depths of each sequence.

TABLE 1
Strata Beneath Site Estimated From Geological Plans

Strata	Thickness in m	Depth in m bgl	Workings recorded by Coal Authority beneath the site	Probability of workings
Mudstone and coal	thin	10	No	coal may be a surface
Penistone Flag Sandstone				
Thin Coal	thin	10-20	No	Unlikely
Mudstone				
Sandstone	0-18			
Black Bed coal	thin	30-40	No	Unlikely
Sandstone				
Mudstone				
Better Bed Coal	thin	60-70	No	Unlikely
Grenoside Sandstone	15-20			
Mudstone				
Greenmoor Sandstone	10-45			

BGS hold records of local boreholes which have been used to assist in interpretation of the geology. Boreholes sunk in the vicinity of the site encountered strata as described in Table 2.

TABLE 2
Local Borehole Logs

BGS Reference no	Depth	Geology in m bgl	Groundwater In m bgl
SE21SW5/A	48.62m	GL – 1.98 Brown strong Clay 1.98 – 3.05 Boulders and Clay 3.05 – 5.49 Shale 5.49 – 7.92 Black Shale & fine clay 7.92 – 12.50 Grey Sandstone 12.50 – 17.07 Grey bind & thin Grit 17.07 – 21.64 Black Shale 21.64 – 25.91 Grey bind 25.91 – 44.81 Grey gritstone 44.81 – 48.16 Black Shale 48.16 FOSSILS 48.16 – 48.62 Black Shale	Circa 12.192m bgl.
SE21SW48	83m	GL – 0.2 Topsoil 1.52 – 1.86 Brown Clay 1.86 – 2.70 Brown Sandstone 2.70 – 20.0 Grey Mudstone 20.0 – 21.0 COAL 21.0 – 31.90 Grey Sandstone 31.90 – 53.70 Sandstone with thin mudstone bands 53.70 – 56.30 Grey Sandstone 56.30 – 68.20 Sandstone with thin grey mudstone bands 68.20 – 71.40 Grey Sandstone 71.40 – 86.00 Sandstone with grey mudstone bands	24.96m bgl

Borehole locations are shown on Figure 5.

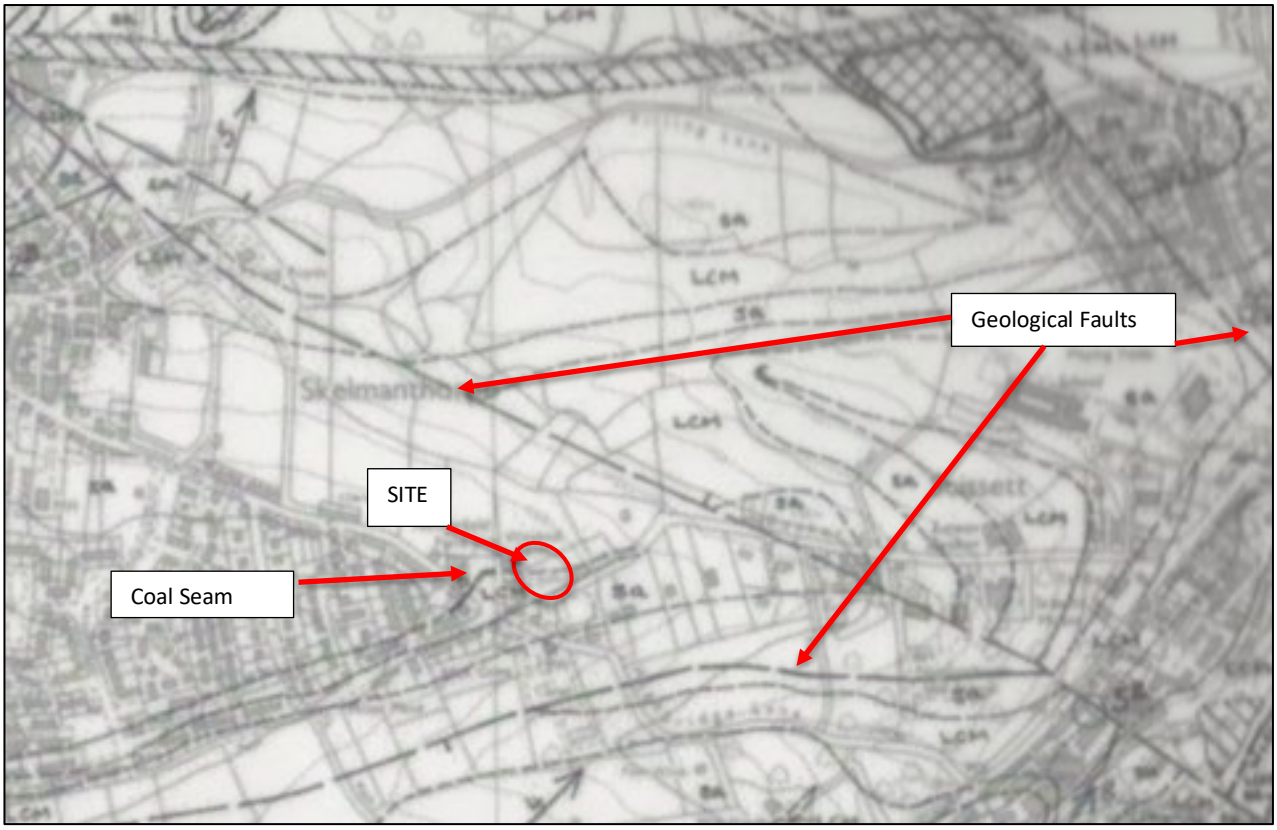


Figure 4 Detailed Coal Seam Geology

A thin coal seam is shown to outcrop across the site underlain by mudstone and sandstone.

4.2 Geological Faults

The geological maps indicate the presence of a geological fault to the south of the site, striking in a west to east direction. Additional geological faults lie to the north west of the site striking west to north east and a fault to the north east of the site striking north west to south east.

No faults are shown to cross the site.

Any faults are unlikely to detrimentally affect the stability of the site unless shallow mined ground is present beneath the site.

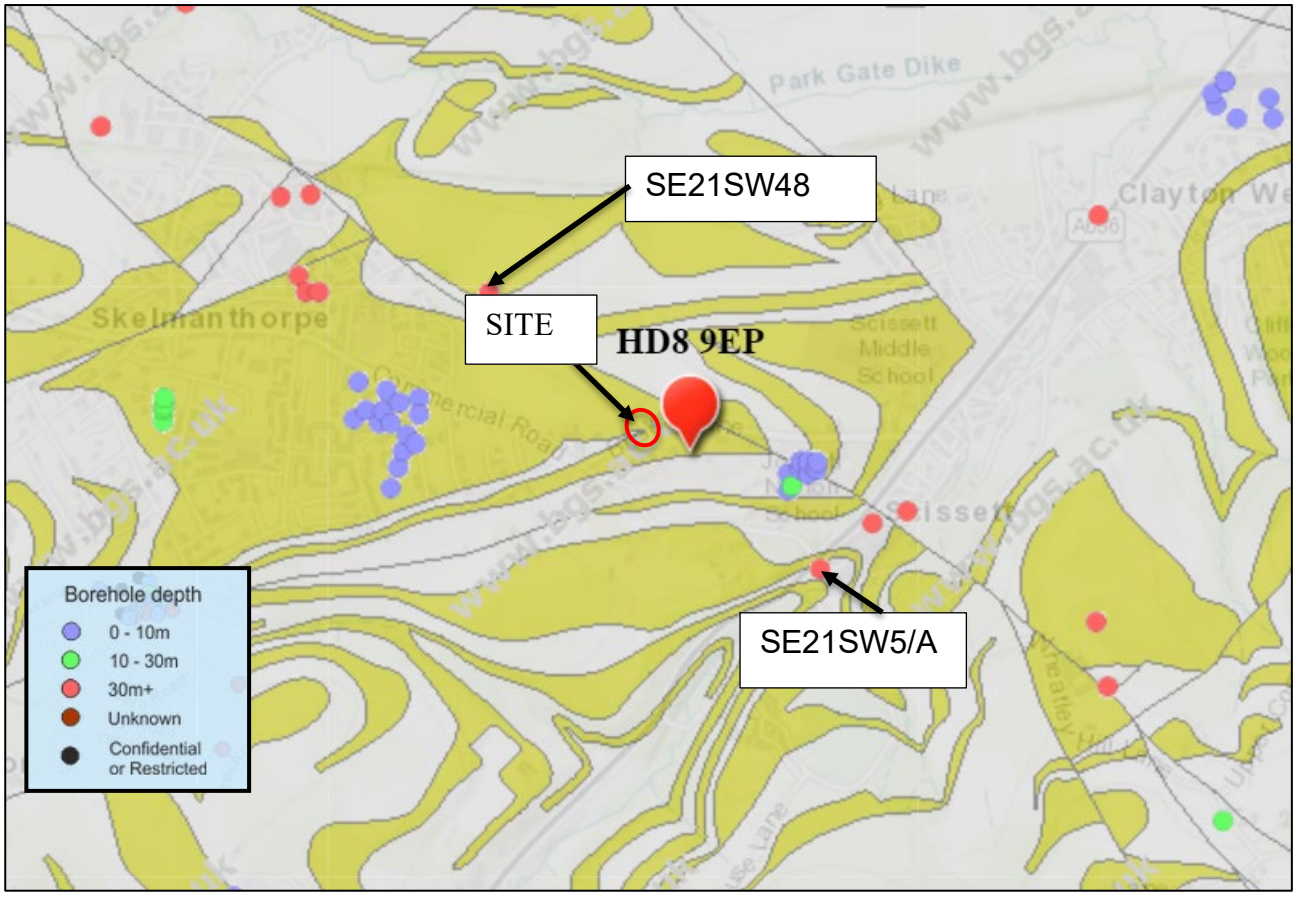


Figure 5 BGS Borehole Location Plan

5. COAL MINING

5.1 The Coal Authority Report

The Mining Report from The Coal Authority for the site states that according to their records the property is not within a surface area that could be affected by any past or present underground coal mining. The site is not in a surface area that could be affected by any present underground mining.

However, the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk.

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods. The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods. The property is not in an area likely to be affected from any planned future underground coal mining. However, reserves of coal exist in the local area which could be worked at some time in the future.

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods. The property does not lie within 200m of the boundary of an opencast site from which coal is being removed by opencast methods. There are no licence requests outstanding to remove coal by opencast methods within 800metres of the boundary. The site is not within 800m of

the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50m of the enquiry boundary since 31st October 1994. There is no current Stop Notice delaying the start of remedial works or repairs to the property. The Coal Authority is not aware of any request having been made to carry out preventative works before coal is worked under Section 33 of the Coal Mining Subsidence Act 1991.

The Coal Authority has no record of a mine gas emission requiring action. The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

The property is not in an area where a notice to withdraw support has been given. The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support. The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof. The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

The Coal Authority Report is presented in Appendix A and should be read in full.

5.2 Shallow Coal Mining

The Coal Authority Report states that they believe there is coal at or close to the ground surface beneath the site. The coal seams present at shallow (<30m bgl) depth beneath the site are shown in Table 1 with the probability of each seam being worked.

Before 1872 there was no requirement to record coal mining and the only evidence of mining is from mine plans in private estate ownership, annotations of 'ancient workings' on abandonment plans, or undertaking drilling to ascertain the condition of the coal. Since 1872 the law requires all coal mine operators to deposit working plans of the mine with the Government following the cessation of operations.

Early workings before 1872 were often shallow and therefore pose a risk by the voids in mined ground migrating by successive roof collapse to the ground surface and causing ground subsidence and structural damage to overlying buildings.

The site lies within an area of historical coal mining activity.

The site lies within a high risk area for development as shown in Figure 6 and within an area of probable shallow coal mine workings as shown in Figure 9. Probable shallow coal mine workings contain locations and estimated extents of probable shallow underground workings for which no recorded plan exists, but where it is possible that workable coal at shallow depths has been mined before records were kept.

There is a **medium to high risk** that the site has been undermined at <30m depth bgl. Any voids remaining in workings at this depth may migrate by successive roof collapse and reach the ground surface to cause subsidence in the future and damage to overlying structures.

The risk that collapse of shallow (<30m bgl) underground workings could cause subsidence at the ground surface above is normally empirically assessed using the T10 rule (developed by the National Coal Board in 1973 and based on experience) whereby if a thickness of 10 x the worked seam

thickness of competent cover (i.e. rock) is present over the worked seam then it is deemed sufficient to be able to choke the voided ground without giving rise to surface settlement.

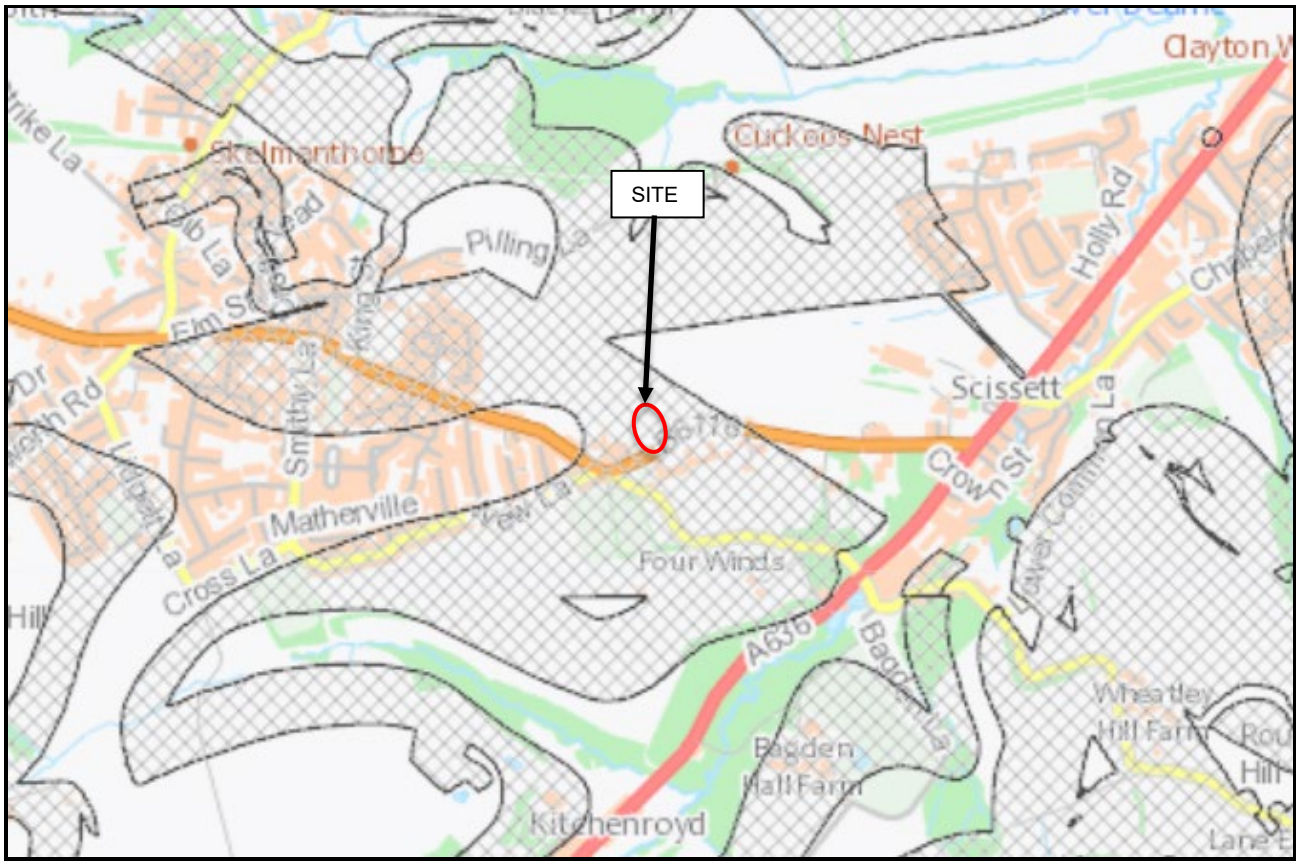


Figure 6 High Risk Development Areas

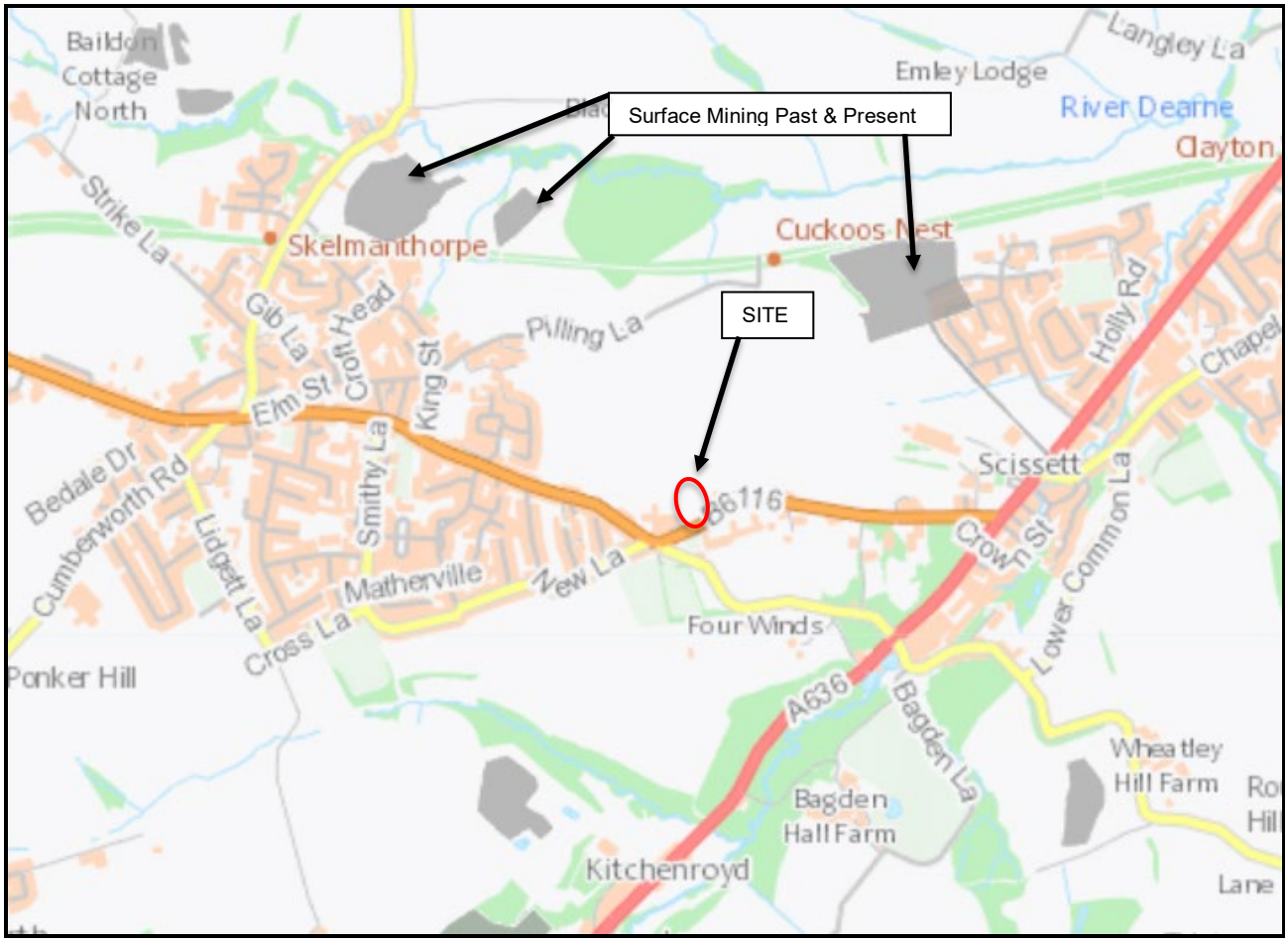


Figure 7 Surface Mining Past and Present

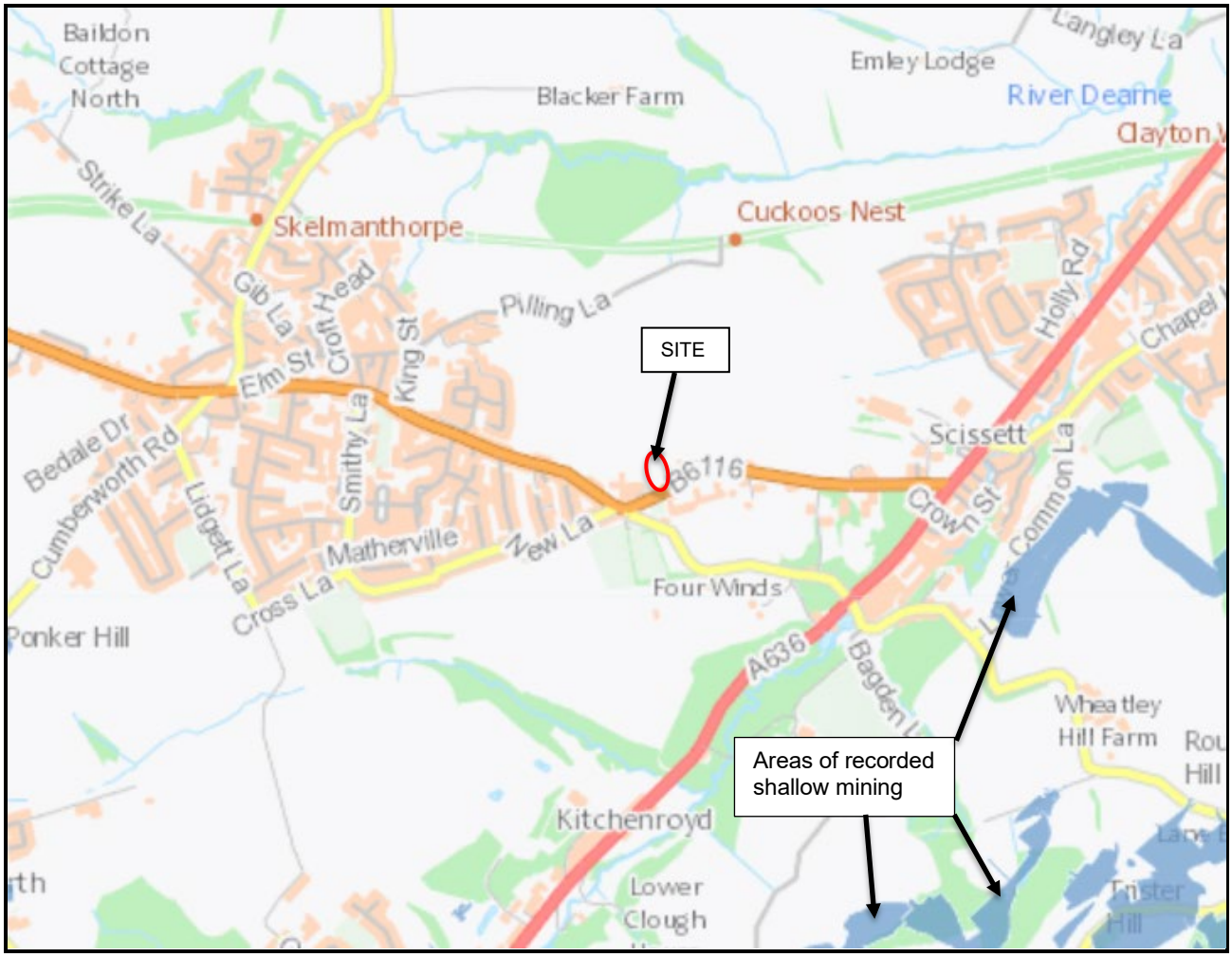


Figure 8 Past Shallow Coal Workings

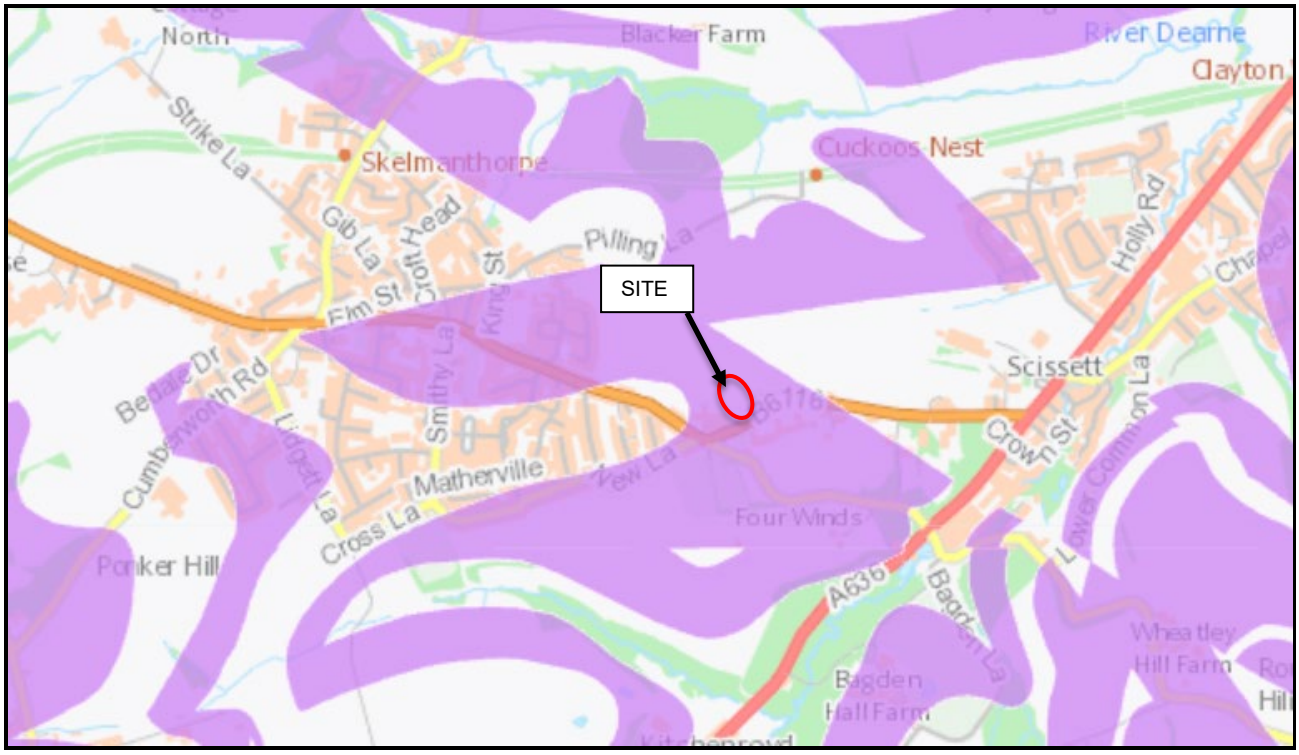


Figure 9 Areas of Probable Shallow Coal Mine Workings

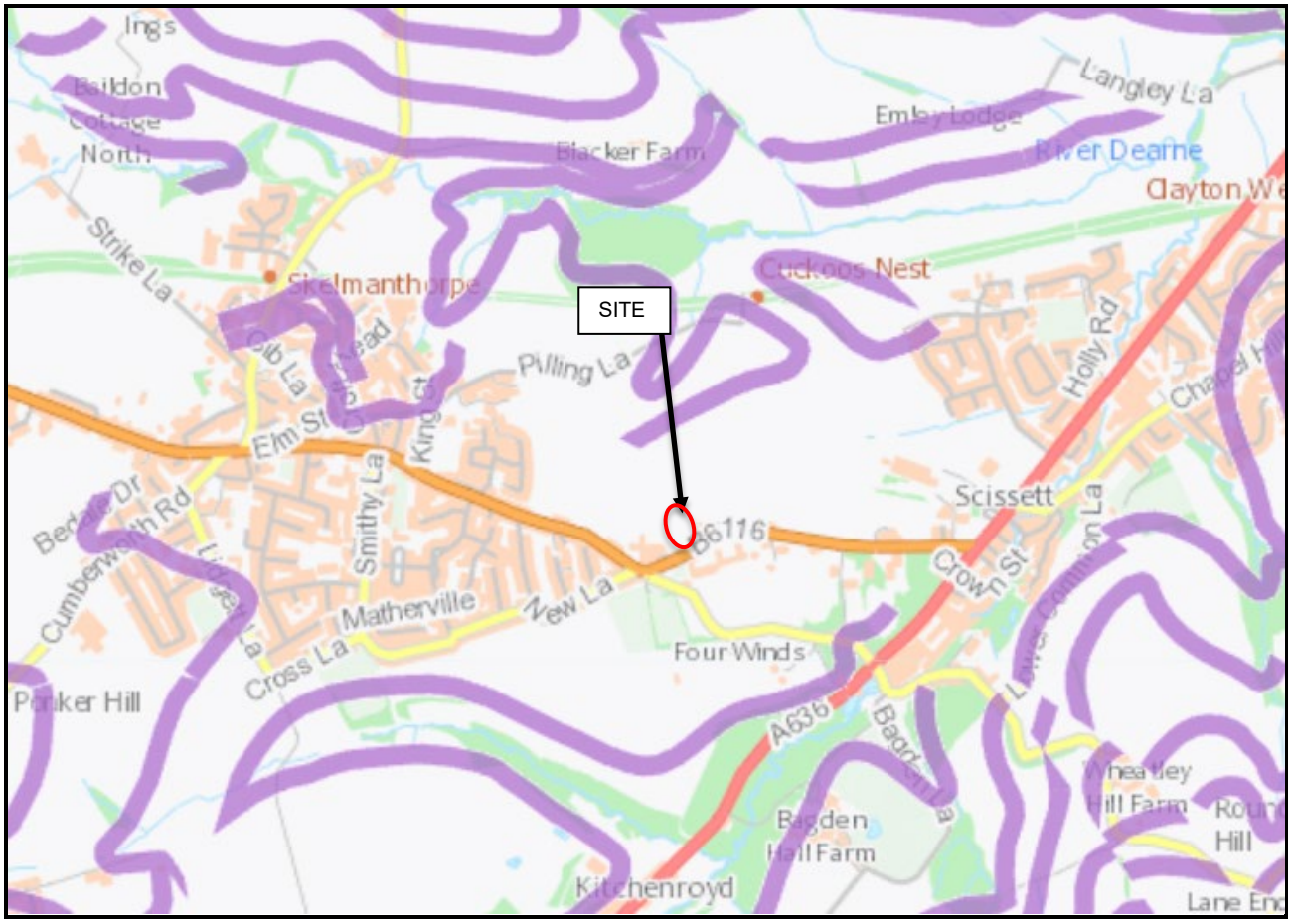


Figure 10 Plan of Coal Seams Outcrop

In summary there is a **medium to high risk** that ground subsidence may occur on the site due to shallow mining in the Black Bed Coal seam. Although the Coal Authority hold no records of such mining, mining may have occurred before the date of 1872.

5.3 Deep Coal Mining

The Coal Authority records that the site is not within an area that may be affected by past underground deep coal mining. Records held by the Coal Authority of deep mining are available on the Abandonment Plans.

It is a **low risk** that any deep mining (>30m bgl) will detrimentally affect the stability of the site due to the substantial cover of competent strata above any workings.

5.4 Mine Shafts and Adits

The Coal Authority Report states that the Coal Authority have no records of any mine shafts within, or within 20m of the boundary of the site. There may be unrecorded mine entries in the local area that do not appear on Coal Authority records.

The closest Mine Shafts are presented in Figure 11 to the east and west of the site and lie at a distance where they will not detrimentally affect stability of the site.

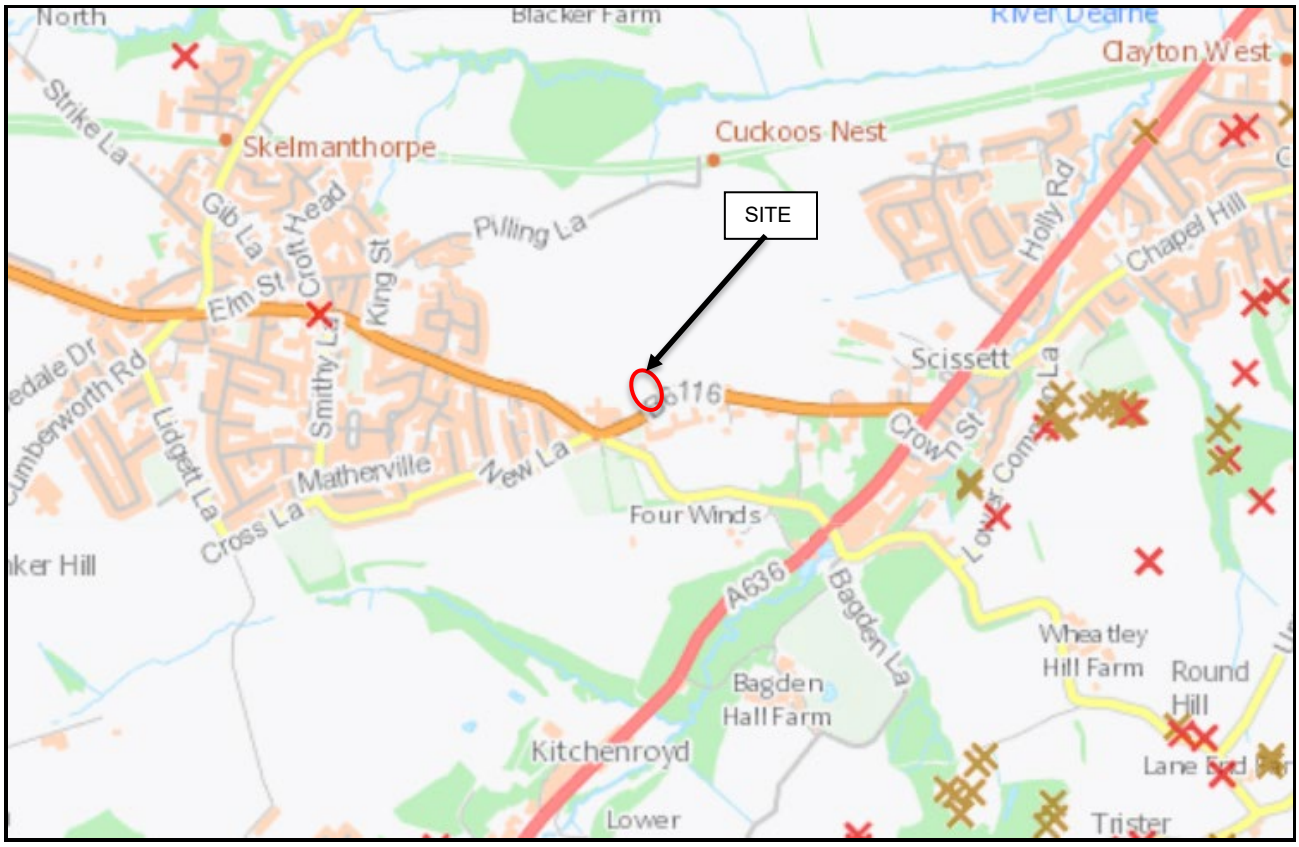


Figure 11 Plan of Mine Shafts

There is a **low risk** that mine shafts and adits may cause ground subsidence and affect the stability of the site in the future. The Coal Authority records are incomplete and any circular features detected on site should always be assessed by an engineer in case it represents an unrecorded mine shaft.

5.5 Mine Gas

The Coal Authority have no record of any mine gases in the site area. However, mine gas should be considered during any drilling, and monitoring should be undertaken in standpipes before construction on the site, in order to assess any mitigating measures for safe development.

6. RISK ASSESSMENT

The Coal Mining Risk Assessment undertaken has indicated that the site is underlain by the Pennine Lower Coal Measures comprising mudstones, sandstones and interbedded coal seams. Based on the BGS geological maps and Coal Authority Report, the site is expected to be underlain by mudstone and the Penistone Flag Sandstone with one near surface coal and two further thin coal seams within 30m bgl and further coal seams at >30m bgl.

The Coal Authority hold no records of shallow mining beneath the site, although shallow mining may have taken place before abandonment records were required. The Coal Authority plans indicate the site does lie in a high risk area for development and an area of probable but not recorded shallow (<30m) coal mining.

If voids remain in any pillar and stall workings in the shallow coal seams at <30m bgl, then they may migrate to the surface and cause ground subsidence if insufficient thickness of competent strata overlies the workings.

Any **shallow coal** workings therefore pose a **medium to high risk** to future site stability.

Any subsidence from mining at depths >30m bgl in the coal seams should be complete. Any voids remaining in these workings are unlikely to migrate to the ground surface due to the considerable cover of competent strata overlying the workings.

The risk of the site being detrimentally affected by workings in **coal at depth** (>30m bgl) is a **low risk** due to the significant cover of competent strata.

The risk that collapse of underground workings could cause subsidence at the ground surface above is normally empirically assessed using the T10 rule (developed by the National Coal Board in 1973 and based on experience) whereby if a thickness of 10 x the worked seam thickness of competent cover (i.e. rock) is present over the worked seam then it is deemed sufficient to be able to choke the voided ground without giving rise to surface settlement.

No mine shafts lie at a distance >20m from the site. The shafts are unlikely to affect the stability of the site due to distance. There are no records of any adits on or within 20m of the site.

7. CONCLUSIONS AND RECOMMENDATIONS

The evidence gathered in this coal mining risk assessment report suggests that there is a medium to high risk that ground subsidence from shallow coal mining could occur in the future.

If ground subsidence occurs due to shallow mining, the risk is that any development constructed on the site may suffer structural damage in the future. It is therefore recommended that an intrusive

mining investigation is undertaken to assess the depth and condition of any coal seams. The investigation should comprise 3 openhole water flush boreholes to 30m bgl with installations to enable monitoring for methane gas. If voids or loose ground and evidence of mining is detected a grouting programme may be required to enable development. Foundation design would need to take into account any grouted mine workings as the grout prevents roof collapse, but does not have bearing strength to support buildings.

If any new circular features appear on the ground in the future development these should be checked by an engineer.

8. GENERAL REMARKS

This report truly reflects the conditions found during the coal mining risk assessment study. Whilst the mining risk assessment was undertaken in a professional manner taking due regard of additional information which became available as a result of ongoing research, the results portrayed only pertain to the information attained and the ground and mining conditions expected. It is possible that other undetected information, undetected ground conditions and undetected mining conditions may exist. The mining risk assessment was only undertaken within the site boundaries and should not be used for interpretation purposes elsewhere. The conclusions are only a brief summary of the report, and it is recommended that the report is read in full to ensure that all recommendations have been understood.

Frances A Bennett
BSc, CGeol, FGS, FIMMM, C.WEM, MCIWEM, CEnv, AIEMA, MIEnvSci.

Appendix **A**

The Coal Authority

CON29M
coal mining report

WINDMILL FARM MENAGE, 1 BUSKER LANE, SKELMANTHORPE, HUDDERSFIELD, KIRKLEES, HD8 9EP

Known or potential coal mining risks

Further action

No further reports from the Coal Authority are required. Further information on any next steps can be found in our Professional opinion.

For more information on our reports please visit www.groundstability.com

Professional opinion

According to the official mining information records held by the Coal Authority at the time of this search, evidence of, or the potential for, coal mining related features have been identified. In view of the coal mining circumstances we would recommend that any planned or future development should follow detailed technical advice before beginning work on site. Please see page 3 for further details on Future development.

Your reference: 3492
Our reference: 51003135091001
Date: 18 May 2022

Client name: ASHTON BENNETT CONSULTANCY

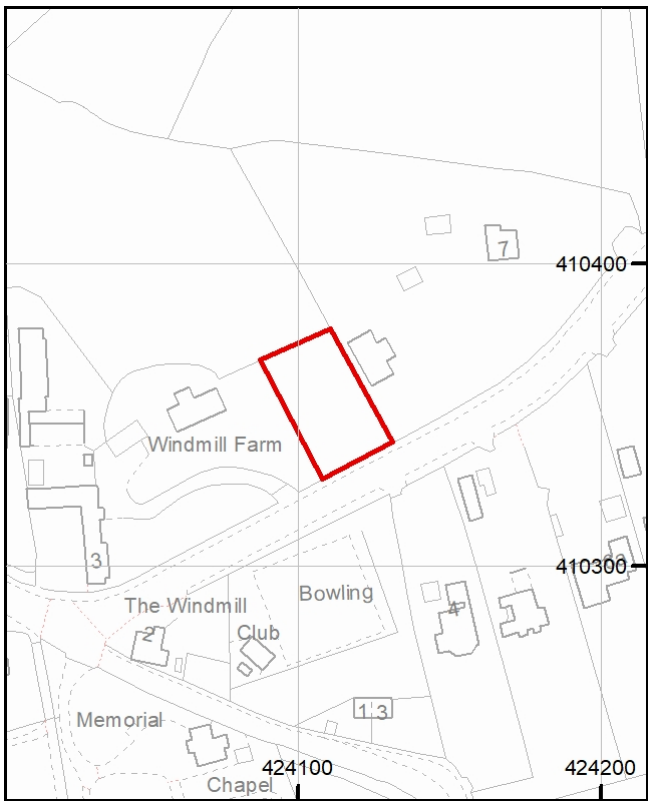
If you require any further assistance please contact our experts on:
0345 762 6848
groundstability@coal.gov.uk

The Law Society

Enquiry boundary

Key

Approximate position of enquiry boundary shown



We can confirm that the location is **on the coalfield**

Map data

This report is prepared in accordance with the latest Law Society's Guidance Notes 2018, the User Guide 2018 and the Coal Authority's Terms and Conditions applicable at the time the report was produced.

Accessibility

If you would like this information in an alternative format, please contact our communications team on 0345 762 6848 or email communications@coal.gov.uk.

Professional opinion

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed.

If you are looking to develop, or undertake works, within a coal mining development high risk area your Local Authority planning department may require a Coal Mining Risk Assessment to be undertaken by a qualified mining geologist or engineer. Should you require any additional information then please contact the Coal Authority on 0345 762 6848 or email cmra@coal.gov.uk.

Detailed findings

Information provided by the Coal Authority in this report is compiled in response to the Law Society's CON29M Coal Mining enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL.

The Coal Authority owns the copyright in this report and the information used to produce this report is protected by our database rights. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

1 Past underground coal mining

The property is not within a surface area that could be affected by any past recorded underground coal mining.

However the property is in an area where the Coal Authority believes there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered, particularly prior to any site works or future development activity, as ground movement could still be a risk. Your attention is drawn to the Professional opinion sections of the report.

2 Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3 Future underground coal mining

The property is not in an area where the Coal Authority has received an application for, and is currently considering whether to grant a licence to remove or work coal by underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4 Mine entries

There are no recorded coal mine entries known to the Coal Authority within, or within 20 metres, of the boundary of the property.

This information is based on the information that the Coal Authority has at the time of this enquiry.

Based on the Coal Authority's knowledge of the mining circumstances at the time of this enquiry, there may be unrecorded mine entries in the local area that do not appear on Coal Authority records.

5 Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6 Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7 Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8 Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9 Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

10 Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11 Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Coal Authority, under its Emergency Surface Hazard Call Out procedures.

12 Withdrawal of support

The property is not in an area where a notice to withdraw support has been given.

The property is not in an area where a notice has been given under section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw support.

13 Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14 Payments to owners of former copyhold land

The property is not in an area where a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Statutory cover

Coal mining subsidence

In the unlikely event of any coal mining related subsidence damage, the Coal Authority or the mine operator has a duty to take remedial action in respect of subsidence caused by the withdrawal of support from land or property in connection with lawful coal mining operations.

When the works are the responsibility of the Coal Authority, our dedicated public safety and subsidence team will manage the claim. The house or land owner ("the owner") is covered for these works under the terms of the Coal Mining Subsidence Act 1991 (as amended by the Coal Industry Act 1994). Please note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

If you believe your land or property is suffering from coal mining subsidence damage and you need more information on what to do next, please use the following link to our website which sets out what your rights are and what you need to consider before making a claim.
www.gov.uk/government/publications/coal-mining-subsidence-damage-notice-form

Coal mining hazards

Our public safety and subsidence team provide a 24 hour a day, 7 days a week hazard reporting service, to help protect the public from hazards caused by past coal workings, such as a mine shaft or shallow working collapse. To report any hazards please call 0800 288 4242. Further information can be found on our website: www.gov.uk/coalauthority.

Glossary

Key terms

adit - horizontal or sloped entrance to a mine

coal mining subsidence - ground movement caused by the removal of coal by underground mining

Coal Mining Subsidence Act 1991 - the Act setting out the duties of the Coal Authority to repair damage caused by coal mining subsidence

coal mining subsidence damage - damage to land, buildings or structures caused by the removal of coal by underground mining

coal seams - bed of coal of varying thickness

future opencast coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal from the surface

future underground coal mining - a licence granted, or licence application received, by the Coal Authority to excavate coal underground. Although it is unlikely, remaining coal reserves could create a possibility for future mining, which would be licensed by the Coal Authority

mine entries - collective name for shafts and adits

payments to owners of former copyhold land - historically, copyhold land gave rights to coal to the copyholder. Legislation was set up to allow others to work this coal, but they had to issue a notice and pay compensation if a copyholder came forward

shaft - vertical entry into a mine

site investigation - investigations of coal mining risks carried out with the Coal Authority's permission

stop notice - a delay to repairs because further coal mining subsidence damage may occur and it would be unwise to carry out permanent repairs

subsidence claim - a formal notice of subsidence damage to the Coal Authority since it was established on 31 October 1994

withdrawal of support - a historic notice informing landowners that the coal beneath their property was going to be worked

working facilities orders - a court order which gave permission, restricted or prevented coal mine workings