COAL MINING RISK ASSESSMENT (CMRA) - BUILDING 2

PROPOSED REPLACEMENT DWELLING

Land at Hill End Farm, Hill End Road, Mapplewell, Barnsley, S75 6DU

Report Ref: TH/Hill End/Bldng2/Rep/CMRA/01/Oct2022/v01

5th October 2022

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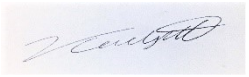
Approved for issue by			
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CONTENTS

1.0 INTRODUCTION

1.1 Terms of Reference

1.2 Site Location & Description

1.3 Proposed Development

1.4 Scope of this Coal Mining Risk Assessment

1.5 Limitations and Exceptions of this Report

2.0 SOURCES OF INFORMATION

2.1 Geology

2.2 Coal Mining Reports

2.3 Historical Mapping

3.0 IDENTIFICATION OF SITE-SPECIFIC COAL MINING RISKS

3.1 Discussion of Potential Risks

4.0 PROPOSED MITIGATION STRATEGY

4.1 Mitigation Strategy

4.2 Coal Authority Permitting

5.0 REFERENCES

Appendices

Appendix A Coal Authority Consultants Report Ref: 51003166653001

1.0 INTRODUCTION

1.1 Terms of Reference

In early October 2022, on the instructions of the Planning Consultant (Mr Tom Warren, Prism Agriculture Ltd) acting for the owner (Mr Needham), Earth-Tech Consulting Ltd were asked to prepare a **Coal Mining Risk Assessment (CMRA)** on land adjacent to the existing house (Building 2) which is the subject of a proposed application for demolition and erection of a replacement dwelling of equivalent proportion at Hill End Farm, Hill End Road, Mapplewell, Barnsley S75 6DU.

The parties involved in the proposed development are:

Property	Existing Barn (Building 1): Hill End Farm, Mapplewell, Barnsley, S75 6DU
Client/Owner	Mr Needham
Planning Consultant	Prism Agriculture Ltd Mr Tom Warren
Mining Consultants	Earth-Tech Consulting Ltd Mr T. M. Hyett MSc BSc CGeol FGS, MCIOB Chartered Geologist & Building Consultant

1.2 Site Location & Description

The site is situated in a semi-rural position off Wentworth Road / Hill End Road in Mapplewell, a former mining village in the metropolitan borough of Barnsley in South Yorkshire, England. Historically part of the West Riding of Yorkshire,

Fig 1 – General Location in South Yorkshire: Hill End Farm, Mapplewell, S75 6DU

Mapplewell is a medium sized village conurbation situated approximately 3 miles north of Barnsley, and 8 miles south of Wakefield at approximately 53°35'11"N - 1°30'9"W at an elevation of around 328 feet (100 m) above sea level.

The village and its environs are traditionally associated with coal mining, and by the late 19th Century coal mining was the predominant source of employment, after the sinking of a deep mine in North Gawber.

The proposed development consists of a new build dwelling house in the grounds of the existing (somewhat dilapidated) house situated next to the detached stone barn (Building 1) which has already been approved for conversion. The site is broadly level and situated to the west and south-west of the existing structure(s).

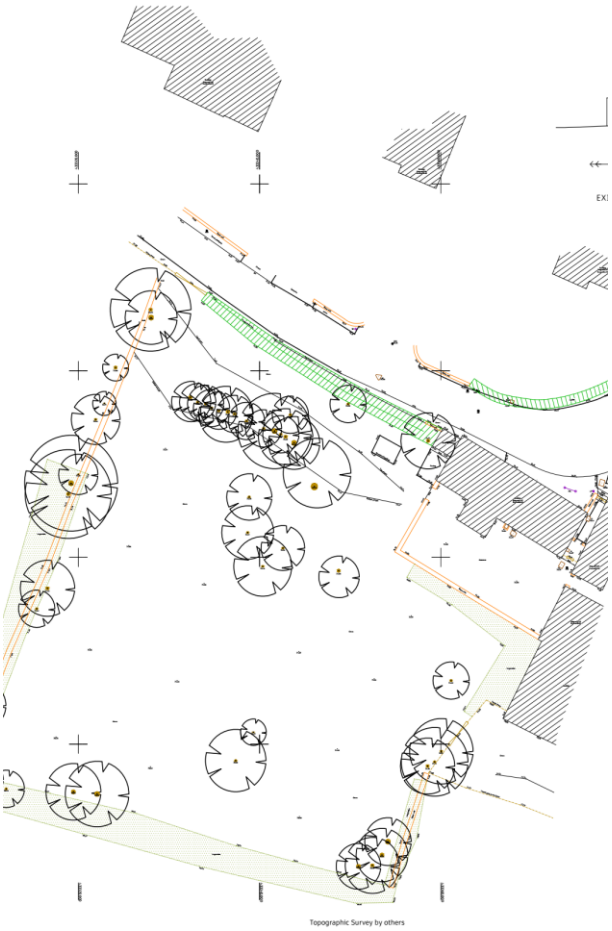


Fig 2 – Block Plan showing the position of the land subject to the application for a replacement dwelling.

Fig 3 – Land to the rear and side of the existing farmhouse where the proposed replacement dwelling is to be situated.

For the proposed replacement dwelling (new build) the Planning Consultant required a site-specific Coal Mining Risk Assessment (CMRA) including, if applicable, preliminary recommendations to investigate and quantify shallow coal mining risk.

In this location, like many others in the district, the Coal Measures were originally built up within a changing coastal environment on the margins of a sea to the east. Forests grew and then subsided under deposits of mud and sand. This resulted in the layers of coal seam, shale and sandstone that feature within the geology of the region today. The western area of the South Yorkshire consists of the *Lower Coal Measures* that outcrop at the surface and dip eastwards. The eastern area contains *Middle Coal Measures* underlain by the deeper Lower Coal Measures. The Coal Measures eventually disappear under younger Permian rocks to the east of the region.

The Middle Coal Measures have numerous coal seams and during the 19th Century deeper mines gradually replaced old outcrop workings. The town of Barnsley, to the south-east of the subject site, grew up near the thickest development of the *Barnsley Coal Seam*, and nearer to the site, the North Gawber colliery in Mapplewell sunk in the 1850s reputedly employed 1200 miners underground and 300 surface workers in 1949 before merging with nearby Woolley colliery after the miners' strike in 1984/5.

1.3 Proposed Development

The proposal consists of the demolition of the existing farmhouse and the construction of a new build dwelling of equivalent proportion relocated slightly to the west and south of the existing in the land parcel within the curtilage of the existing farmhouse. As shown below.

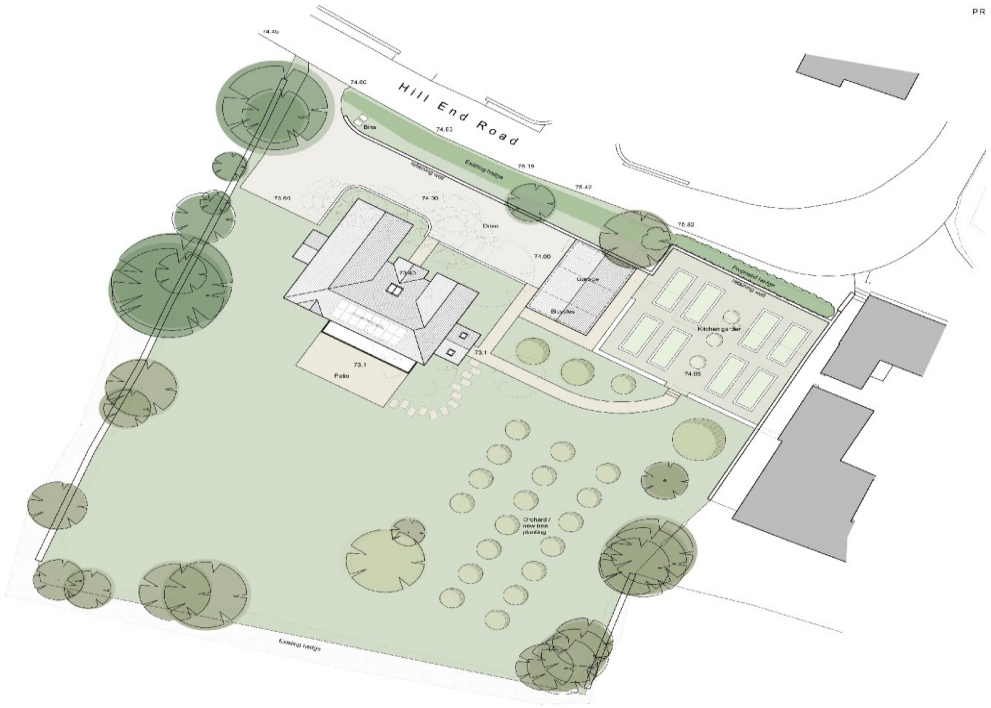


Fig 4 – Site Plan showing proposed new build within the grounds of the demolished Farmhouse – Hill End Farm, Mapplewell, S75 6DU.

1.4 Scope of this Coal Mining Risk Assessment

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

- Present a desk-based review of all readily available information on 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 cumulative impact of issues;
- Set out appropriate mitigation measures to address coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development; and
- Demonstrate to the Local Planning Authority that the application site is or can be made safe and stable by appropriate mitigation measures to meet the requirements of national planning policy (and the Coal Authority where required) with regard to development on unstable land.

All information, comments and opinions given in this coal mining risk assessment are based on the information obtained. The information search cannot be exhaustive and there may be records that have not come to light. There may also be circumstances at the site that are not documented.

1.5 Limitations and Exceptions of this Report

This CMRA report was undertaken for the site owner (Mr Needham) and as such should not be entrusted to any third party without written permission. This report has been compiled from a variety of sources, within the time constraints of the program, which we believe to be trustworthy.

The findings and opinions provided in this document are made in good faith and are basedon data provided by third parties (*Groundsure, Environment Agency, The Coal Authority, and Regulatory Bodies*). The accuracy of map extracts cannot be guaranteed, and it should be recognised that different conditions on /adjacent to the site may have existed between and subsequent to the various map surveys.

This report is prepared and written in the context of the purposes stated above and should not be used in a different context. Furthermore, new information, improved practices and legislation may necessitate an alteration to this report in whole or in part after its submission. The report should be read in its entirety, including all associated drawings and appendices. *Earth-Tech Consulting Ltd* cannot be held responsible for any misinterpretations arising from the use of extracts that are taken out of context.

2.0 SOURCES OF INFORMATION

2.1 Geology

Information on the geology of the site was obtained from the following sources published by the British Geological Survey (BGS) and others:

- Coal Mining Consultants Report Ref: 51003166653001 (see Appendix A)
- Abandonment plans – NE1037 'Woolley/Redbrook Colliery', NE158 (6 of 11) 'Woolley Barnsley and North Gawber' Rationalised plans – 44 3210 and 44 3209.
- County Geological Sheet Yorkshire 262SE (1932), British Geological Survey England and Wales Sheet 87 Barnsley (2008)
- The BGS digital geology map, which utilises the most up to date names for geological units (www.bgs.ac.uk/data).
- The BGS Lexicon of Named Rock Units, which provides typical descriptions for most geological units (www.bgs.ac.uk/lexicon).
- BGS National Geoscience Data Centre collection of onshore scanned boreholes, shafts and well records – specifically boreholes: SE30NW547, SE30NW9/C and SE30NW9/A.

The published geological information shows superficial strata present at the site and the solid geology is shown to be of the Pennine Middle Coal Measures Formation. This formation is sedimentary in origin and comprises an interbedded sequence of sandstones, siltstones, and mudstones, with subordinate beds of ironstone, coal and seat-earths.

Superficial: Medium sandy loam TOPSOILS over intermittent layers of '*brown, soft to firm, sandy, silty CLAY*' (GLACIOLACUSTRINE DEPOSITS). No *Made Ground* is identified beneath the study area by research and/or observation.

Solid geology: Predominantly a rough sandstone and millstone grit formation, and the *Pennine Lower Coal Measures Formation (PLCM-MDSS)* of the Langsettian Sub-age, which is a mixture of mudstone, siltstone and sandstone containing coal measures and marine fossils. The sandstone within the area may have historically been quarried in locations off-site, and the location is well known to be dominated by historic coal mining activity in all directions. Possible presence of Rough Stone Sandstone and Millstone Grit, Mudstone, Siltstone and Sandstone.

The development site sits upon the Pennine Middle Coal Measures Formation. The closest BGS borehole to the site, SE30NW547, located approximately c.350m northeast of the site, records 10ft 8in (3.25m) of top soil and clay; however local ground deposits may vary. No faults, fissures or break lines are known to affect the development site.

2.2 Historical Mapping

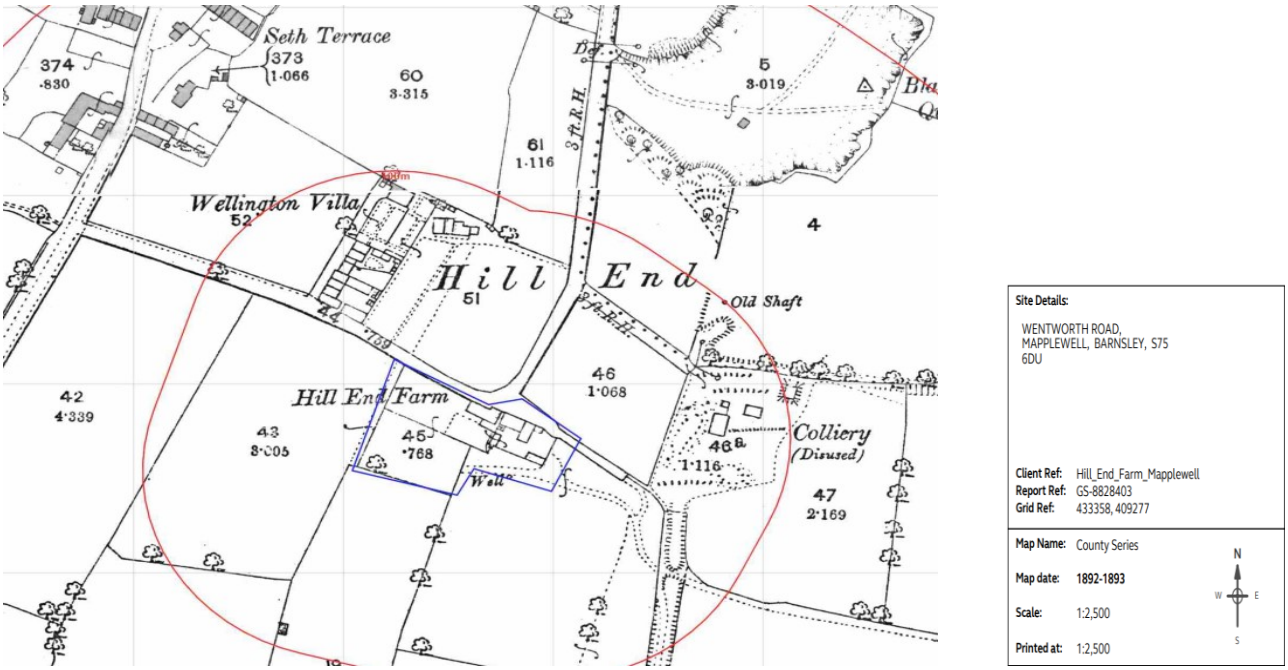


Fig 5 – County Series Historical Map 1892 to 1893

Summary of ON-SITE Features

Dates	Features (within 250m)	Distance	Direction
1892 - 1893	Agricultural Barn surrounded by open fields	On site	All
1921	No significant change	On site	All
1910 – present	No significant change	On site	All

Summary of OFF-SITE Features

Dates	Features (within 250m)	Distance	Direction
1893-93	Fields to the north, west and south. Colliery located 65m to the east. An 'Old Coal Pit' is shown.	 65m 136m	 East North East
1898 – 1921 – current	No significant change		

The historical maps show that the overall development site (Hill End Farm) is relatively unchanged in the past 100 years. Staincross and Mapplewell was initially an area known for nail making, but the surrounding area has also experienced a significant amount of coal mining and ground excavation. Numerous former collieries are located in the wider district, the most notable being the North Gawber which emerged at a time coalmining was fast developing at the time when the nail making was on the decline, creating an almost continuous flow of incomers arriving from places such as Staffordshire, Wales, Lancashire and Derbyshire.

North Gawber Colliery was the biggest attraction, after it was sunk to the Barnsley seam from 1850-52 by the Thorps of Gawber Hall but taken over by Fountain & Burnley (who also owned Woolley Colliery) in 1882. The pit, with its associated coke ovens, dominated the eastern side of the village, reached via Blacker Road. A terrible disaster occurred in 1935 when 19 men were killed following an explosion in the Lidgett Seam, on 12 September. During heroic rescue operations

an anxious crowd of 4,000 assembled at the pithead. After a short association with Woolley, North Gawber closed at the end of 1987.

2.3 Coal Mining Reports

Information has been obtained from the Coal Authority (CA).

- As part of the preparation of this report a Consultant Coal Mining Report (Ref: 51003166653001) was obtained which gives more detail than the residential report.
- The Coal Authority online interactive map was also reviewed. http://mapapps2.bgs.ac.uk/coalauthority/home.html

The Coal Authority report is appended and should be read in conjunction with this Risk Assessment. The pertinent points of the Coal Authority reports are summarised below.

Coal Authority Interactive Map
The Coal Authority interactive map shows the site to lie in a Development High Risk Area and an area of historical coal mining activity.

Consultant Coal Mining Report
The mining report indicates that there are known workings present beneath the property itself:

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
NORTH GAWBER	BARNSLEY	Coal	64P3	77	North	7.9	North-East	277	1878
WOOLLEY	LOW HAIGH MOOR	Coal	64P8	137	North-West	3.7	North-East	64	1944
DEARNESIDE	BARNSLEY	Coal	64P4	144	Beneath Property	3.3	North	277	1879
DARTON	BARNSLEY	Coal	64P2	150	South-West	2.5	North-East	269	1879
DARTON	LIDGETT	Coal	64P9	181	West	3.7	East	72	1932

Probable Unrecorded Shallow Workings
The Consultant Coal Mining Report indicates that there are probable unrecorded shallow workings beneath the site. The report indicates that there are no recorded spine roadways present at shallow depth beneath the site.

Mine Entries
There are mine entries recorded within 100m of the site.

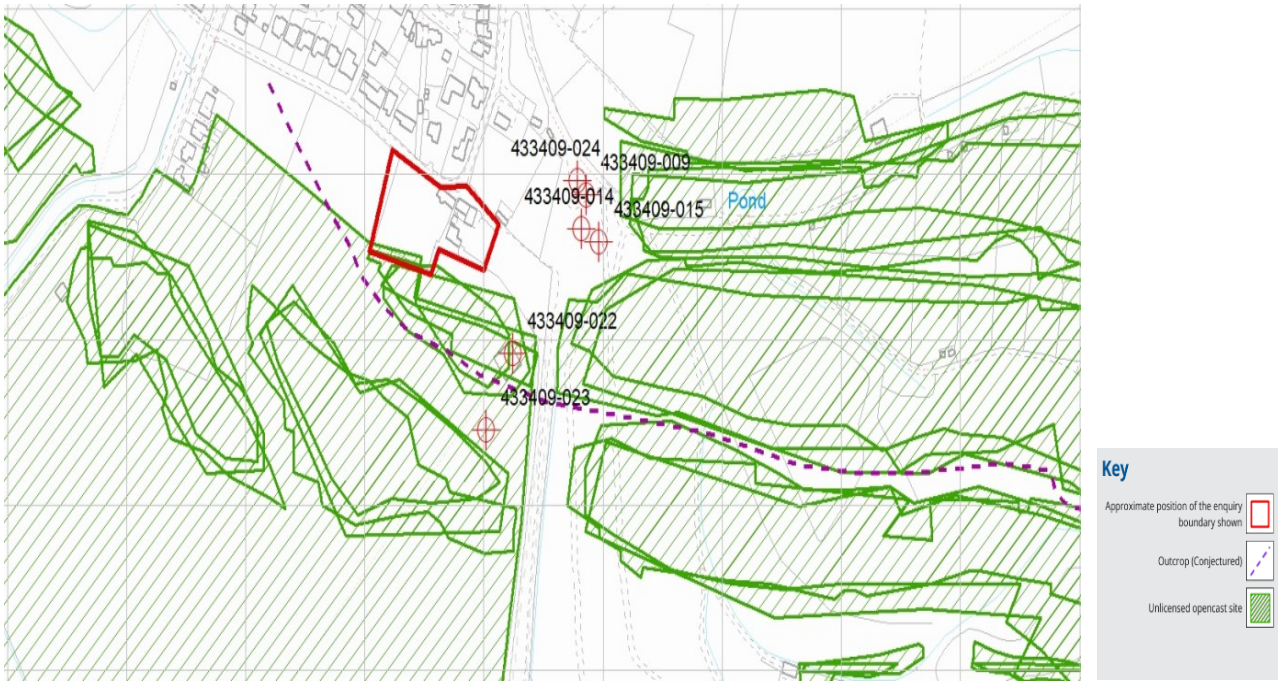
Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	433409-009	433486 409287	is filled to full depth and was capped with a 7.2m x 7.2m x 0.95m thick octagonal reinforced concrete cap at approximately 2.8m bgl in 2001 by IMC Ltd. on behalf of the Coal Authority	Coal	
Shaft	433409-014	433482 409267		Coal	
Shaft	433409-015	433497 409259		Coal	
Shaft	433409-022	433425 409191		Coal	
Shaft	433409-023	433402 409145		Coal	
Shaft	433409-024	433479 409296		Coal	

Outcrops
The report indicates the WINTER coal seam outcrops within 13m of the subject site.

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
WINTER	Coal	Yes	13.0	South-West	153

Geological Faults, Fissures and Breaklines
No faults, fissures or breaklines are recorded beneath the site.

Opencast Mines
There are no recorded opencast mines on site. Local knowledge indicates there are historical unlicensed opencast sites located in all directions of the site, and the Consultant Coal Report also shows in the summary of findings map that the surrounding area has been heavily mined by opencast processes, the nearest lies immediately adjacent and to the north and west of the site.



3.0 IDENTIFICATION OF SITE-SPECIFIC COAL MINING RISKS

3.1 Risk Assessment Methodology

Hazard (H) is something with a potential to cause *harm*.
Severity (S) is the *magnitude* of the harm the hazard could cause.
Probability (P) is the *likelihood* the hazard will occur.
Risk (R) is the likelihood of the hazard (x) the severity of the harm it could cause.

Risk Rating (RR) = Severity (S) x Probability(P)

Probability (P)

Probability of Risk	1. Remote 2. Possible 3. Probable	Unlikely but conceivable May occur, could well occur May occur several times, occurs frequently

Severity (S)

	1. Negligible	*Human Health:* no chance of injury *Environment:* no chance of harm to the environment *Project:* no impact on construction works
	2. Minor	*Human Health:* minor harm with short term effects *Environment:* nuisance and minor disturbance to flora and fauna *Project:* minor changes required to achieve construction objectives with low costs and/or delivery implications
	3. Moderate	*Human Health:* major injury or disability or ill-health with long term effects *Environment:* potentially fatal to flora and fauna for days / weeks *Project:* major changes required to achieve construction objectives with significant costs and/or delivery implications
	4. Severe	*Human Health:* permanent disability / death *Environment:* detrimental to local eco-systems for months / years *Project:* catastrophic impact on construction objectives

Risk Rating (RR)

PROBABILITY	MINOR	SEVERE	EXTREME
Remote	1	2	3
Possible	2	4	6
Probable	3	6	9

1	VERY LOW	*Risk is negligible – no action required*
1-2	LOW	*Risk is controlled as far as is reasonably practicable, no further control measures necessary*
3-4	MODERATE	*Risk should be evaluated and controlled as far as is reasonably practicable*
6-9	HIGH	*Hazard should be avoided – Ground remedial measures required*

3.2 Discussion of Potential Risks

A desk-based study of the coal mining information has been used to risk assess the coal mining features above. A summary of the risk posed by these features is summarised after thorough analysis of the information sources. Comment on each specific coal mining issue follows below:

3.2.1 Underground Coal Mining (recorded at shallow depths).

Coal mining at depths shallower than 30m beneath ground level can typically pose challenges to ground stability at the surface. The magnitude of this effect depends upon the exact depth of any workings, the thickness of competent rock cover and the extraction thickness of any coal mine workings.

The Coal Authority Coal Mining Consultants report in Appendix A shows that the development site is not in an area of recorded shallow coal mine workings. The Consultants Report indicates that the site is underlain by, or is in proximity to, workings in various seams of coal at between 77m and 181m bgl.

The shallowest of these is the Gawber (Barnsley) seam, recorded to have been worked beneath the development area at 77m bgl with an extraction thickness of 3.32m and last worked in 1861. The rationalised sheet 44 3210 NY210K (Barnsley seam) indicates workings across the site area. The closest date on this plan indicates workings were undertaken in 1861 and a section thickness of 332cm is indicated for the majority of this plan, including the site area, which corroborates the Consultants Report.

The workings beneath the site are shown on abandonment plan NE158 (1 of 6) as being pillar and stall workings, however no levels are recorded for workings in this area. Two sections for the Barnsley seam shown on this plan generally indicate an upper (softs) and lower (hards) set of coal horizons, separated in both sections by a clay/dirt horizon, with total seam thickness including clay/dirt bands of 2.99-3.32m, corresponding with the seam thickness indicated in the Consultants Report.

Rationalised sheet 44 3209 NY210K (Barnsley seam) captures the extent of workings up to the national gridline approximately 10m south of the site. This plan shows workings in Mapplewell Colliery/North Gawber Colliery extending up to this gridline. Based on seam contours shown on the plan the Barnsley seam can be estimated to be present at approximately 17m AOD (83m bgl) adjacent to the proposed development site. An approximate rate of dip of 3.7° east can be estimated from this plan. Based on the likely depth of workings in the Barnsley seam the risk to the proposed development is considered to be low.

3.2.2 Underground coal mining (probable at shallow depths)

Areas of probable shallow coal mine workings are identified as part of the Development High Risk Area for which no recorded plan exists, but where it is likely that workable coal at shallow depths has been mined before records were kept.

The data has been estimated from available mining records by qualified mining surveyors. Since 1872 there has been a law that requires all coal mine operators to deposit working plans of the mine with the government following the cessation of operations. Prior to this date the plans were often destroyed or kept in private ownership. Where the extraction of coal has occurred there is the potential for voids to remain long after mining has ceased.

The depth of workings generally dictates the length of time that significant voids may remain, but other factors including the size of mine roof supports and the competency of overlying strata can influence the time for natural consolidation to occur. Waste material produced during mining was sometimes used to backfill abandoned sections of mine workings, therefore reducing the volume of open cavities or voids that remain. The method of backfilling workings is typically not recorded and cannot be relied upon as a satisfactory form of remediation.

The Coal Authority Coal Mining Consultants report in Appendix A shows that the development site is in an area of probable shallow coal mine workings. The Consultants report also indicates that the WINTER seam outcrops approximately 13m south of the site and may be of workable thickness.

The shafts of North Gawber Colliery (BGS borehole records SE30NW9/C and SE30NW9/A located approximately 120m east of site) indicate local seam separations between the Kent's Thin, Kent's Thick/Mapplewell, Barnsley Rider and Barnsley seams of 21.12- 21.54m, 40.38m and 25.7m, respectively. These separations are significantly greater than those estimated from the indicative dip rates above. The rationalised plans NY190K and NY180K indicate the Kent's Thick and Kent's Thin seams to have local extraction thicknesses of 89cm and 61cm respectively and the North Gawber shafts mentioned above indicate the Kent's Thin, Kent's Thick and Barnsley Rider seams to have thicknesses of 0.61-0.76m, 0.99-2.38m and 0.46m, respectively.

The British Geological Survey England and Wales Sheet 87 Barnsley (2008) sheet includes a Generalised Vertical Section (GVS), which gives the following indicative seam thicknesses for those seams between the Kent's Thin coal and Barnsley Coal: Kent's Thin (0-1.9m), Kent's Thick/Mapplewell (0.3-2.6m), thin unnamed coal, Barnsley Rider Coal (0-0.7m), thin unnamed coal, Warren House Coal (0-0.1m) and Barnsley Coal (0-3.9m). Abandonment plan NE1037 for local workings in the Kent's Thick seam records a 23.3m separation between Kent's Thin and Kent's Thick from borehole U1, however it is not clear where this borehole is located. A section of the Kent's Thick seam on this plan shows coal 0.15m, seatearth 0.46m, coal 1.07m and seatearth of unknown thickness (total thickness of 1.68m excluding lower seatearth horizon).

Based on the indicative seam separations mentioned above and the likely local thickness of these seams, it is possible that insufficient competent cover may exist above the WINTER seam. It is also possible that there may be insufficient competent cover above the Kent's Thick/Kent Thin/Mapplewell seam if the seam extraction thickness is at the greater end of the figures indicated and if the seam separation is at the lesser end of the figures indicated. It is likely that there will be sufficient competent cover above the Barnsley Rider Coal even if extracted at its maximum seam thickness, however the competency of overlying seams should be proven through ground investigations. Consequently, it is

considered that the risk to the proposed development from unrecorded shallow workings in the Winter, Kent's Thin and Kent's Thick/Mapplewell seams is MEDIUM.

3.2.3 Mine entries (shafts and adits)

The Coal Authority Coal Mining Consultants report in Appendix A shows mine entries are recorded within 150m of the development site. The development site sits within a historical mining area and therefore there is a residual risk of unrecorded mine entries to be present on site. All site operatives should be made aware of this potential risk and a watching brief should be maintained during site works.

3.2.4 Coal mining geology (Faults and fissures)

The development site sits upon the Pennine Middle Coal Measures Formation. The closest BGS borehole to the site, SE30NW547, located approximately 370m northwest of the site, records 10ft 8in (3.25m) of top soil and clay; however local ground deposits may vary. No faults, fissures or break lines are known to affect the development site.

3.2.5 Record of past mine gas emissions or potential

The Barnsley seam is known to be liable to spontaneous combustion.

There are no recorded past gas emissions recorded in the surrounding area, however, coal seams and coal mine workings pose a potential gas risk which should be considered in any future investigations and development. At development sites with shallow coal workings, probable shallow coal mine workings, or pathway features such as mine entries and geological disturbances on or nearby the site, the Coal Authority recommends that a more detailed gas risk assessment to be undertaken in accordance with relevant guidance.

3.2.6 Recorded coal mining surface hazard

None recorded.

3.2.7 Surface mining (opencast workings)

The Coal Authority Coal Mining Consultants report in Appendix A indicates extensive areas of opencast extraction immediately adjacent and surrounding the site.

These sites are recorded on rationalised plan 44 3209 (Opencast Workings) and are annotated as 'North Gawber Colliery Sites'. The rationalised plan indicates that these sites and others locally have been sourced from an Opencast Executive Consultation Plan.

This plan has been reviewed and whilst the site boundaries are recorded and coal is recorded to have been worked from them, no further information or source plans are given. Due to the nature of the development (i.e. a conversion of an existing barn) the risk to the proposed development is considered to be LOW.

3.2.8 Groundwater

The Pennine Coal Measures rocks constitutes a multi-layered aquifer in which the thick, massive grit and sandstone horizons effectively act as separate aquifers with the intervening mudstones and mudstones acting as aquicludes or aquitards, although faulting may locally juxtapose them into hydraulic connection. Groundwater storage and movement in the well-cemented grits and sandstones is predominantly through fractures and joints with only minor contributions from the rock matrix.

Little or no water is normally obtainable from mudstone horizons although small quantities may be present in thin interbedded sandstones.The groundwater potential of the main water-bearing horizons is very variable and some horizons may only be of local importance. Yields are in consequence highly variable even over short distances. Initial yields are not however always sustainable, sometimes declining with time as storage is depleted by pumping. Abundant springs are frequently located at junctions between sandstone and mudstone horizons.

3.2.9 Summary

The table below summarises the potential risks associated with coal mining legacy for the proposed development site, identified from the sources of information in Section 2 of this report. Other than coal mining legacy risk, a detailed check of the Geo-insight Report confirms that the site is unaffected by Natural Cavities; Gypsum Extraction; Tin Mining; Brine Extraction, and/or Clay Mining.

TABLE 3: SUMMARY OF POTENTIAL COAL MINING LEGACY RISKS

Coal Mining Issues	Yes	No	Risk Assessment	
			Risk Rating	Comment
Underground coal mining (recorded at shallow depths)		√	**LOW**	*None recorded*
Underground coal mining (possible shallow depths)	√		**MODERATE**	*Probable unrecorded shallow workings in the WINTER (and possibly Kent's Thin and Kent's Thick/Mapplewell seams*
Mine entries (shafts or adits)	√		**LOW**	*None recorded*
Coal mining geology (fissures)	√		**LOW**	*None recorded*
Record of past mine gas emissions		√	**MODERATE**	*The Barnsley seam is known to be liable to spontaneous combustion. All mine workings pose a potential gas risk which should be considered in any future investigations and development*
Record of coal mining surface hazard		√	**LOW**	*None recorded*
Surface mining (opencast workings)		√	**LOW**	*Opencast extraction areas close to site boundaries but development proposals are conversion of an existing barn*

4.0 PROPOSED MITIGATION STRATEGY

4.1 Mitigation Strategy

It is recommended that the following measures be undertaken to mitigate against the risks posed to the site identified in Sections 2 and 3 of this report:

a. It has been identified that there is a **MEDIUM** risk associated with the development from unrecorded shallow mine workings. Coal seams may underlie the site at a depth of < 20m - the estimated depth is based on dips from coal seams at greater depth.

b. The proposed development is a new build replacement dwelling house. It is therefore recommended that a suitable scheme of intrusive investigation involving rotary boreholes / probe holes be undertaken to better quantify the risk, along with series of trial holes to identify the near surface geology.

c. Drilling of these boreholes /probe-holes would be to confirm the depth of the coal seams underlying the site. Assuming the coal is at a depth of approximately 20m it is recommended that at least 1No. borehole is drilled to 30m, especially if coal is not encountered, to confirm the stratigraphy.

d. In the unlikely event that a risk of instability is proved, then a suitable treatment solution involving the injection of cement/pfa grout into the shallow workings will be required to infill the potential voids and increase the stability of the ground.

The existence of potentially unstable unrecorded mine entries (shafts) is unlikely within the site boundary but cannot entirely be discounted. Construction works should proceed cautiously recognising that unstable mine entries could be present. Should any anomalous ground conditions be encountered during the course of the development works then further advice should be sought from ***Earth-Tech Consulting*** regarding further investigation and remedial works.

4.2 Coal Authority Permitting

Prior written permission 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: https://www.gov.uk/get-a-permit-to-deal-with-a-coal-mine-on-your-property .

Any application for a Coal Authority Permit will require a Method Statement and Risk Assessment for the drilling works.

Testimony of Independence

I confirm that under para. 2.E.2 of Appendix 2E of *Planning Policy Guidance Note 14 (PPG14) – Development on Unstable Land, DoE, 1990* I am suitably qualified to make these statements, and I understand that my overriding duty is to present independent and impartial expert analysis, and I believe I have complied with that duty. The facts I have stated in this report are true and the opinions I have expressed are correct and they are entirely my own, based upon the evidence I have been shown and my own observations.

Signed

.....
Tim Hyett LLM MSc CEng MIEI CGeol FGS MCIOB
Chartered Consultant Engineering Geologist
Earth-Tech Consulting Ltd
5th October 2022

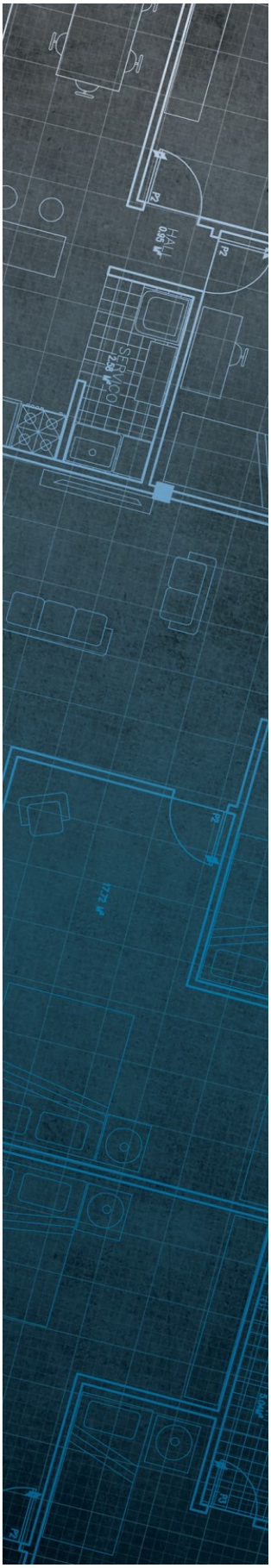
Appendix A Coal Authority Consultants Report

The Coal Authority

Consultants

Coal Mining Report

Wentworth Road, Mapplewell,
Barnsley, S75 6du
South Yorkshire



Date of enquiry:	16 June 2022
Date enquiry received:	16 June 2022
Issue date:	16 June 2022
Our reference:	51003166653001
Your reference:	GS-8828404

Consultants

Coal Mining Report

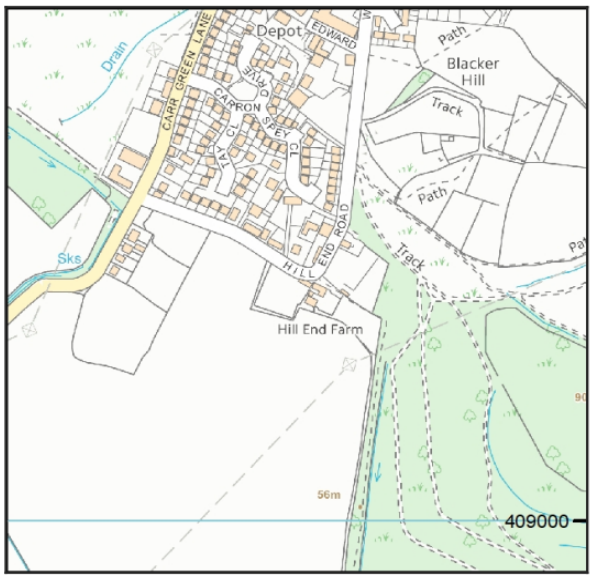
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

GROUNDSURE LIMITED

Enquiry address

Wentworth Road, Mapplewell, Barnsley, S75 6du
South Yorkshire



Approximate position of property

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/thecoalauthority
/thecoalauthority

Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
NORTH GAWBER	BARNSLEY	Coal	64P3	77	North	7.9	North-East	277	1878
WOOLLEY	LOW HAIGH MOOR	Coal	64P8	137	North-West	3.7	North-East	64	1944
DEARNESIDE	BARNSLEY	Coal	64P4	144	Beneath Property	3.3	North	277	1879
DARTON	BARNSLEY	Coal	64P2	150	South-West	2.5	North-East	269	1879
DARTON	LIDGETT	Coal	64P9	181	West	3.7	East	72	1932

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

Entry type	Reference	Grid reference	Treatment description	Mineral	Conveyancing details
Shaft	433409-009	433486 409287	is filled to full depth and was capped with a 7.2m x 7.2m x 0.95m thick octagonal reinforced concrete cap at approximately 2.8m bgl in 2001 by IMC Ltd. on behalf of the Coal Authority	Coal	
Shaft	433409-014	433482 409267		Coal	
Shaft	433409-015	433497 409259		Coal	
Shaft	433409-022	433425 409191		Coal	
Shaft	433409-023	433402 409145		Coal	
Shaft	433409-024	433479 409296		Coal	

Abandoned mine plan catalogue numbers

The following abandoned mine plan catalogue numbers intersect with some, or all, of the enquiry boundary:

NE158	NE1001	16345
NE1035	NE1036	NE978
BE29	7191	NE979

Our records show we have more plans than those shown above which could affect the enquiry boundary.

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
WINTER	Coal	Yes	13.0	South-West	153

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations
None recorded within 50 metres of the enquiry boundary.

Remediated sites
None recorded within 50 metres of the enquiry boundary.

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.

Mine gas
None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes
None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining
None recorded.

Coal mining licensing
None recorded within 200 metres of the enquiry boundary.

Court orders
None recorded.

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

Withdrawal of support notices
The property is in an area where a notice to withdraw support was given in 1982.

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.

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.

Section 4 – Further information

The following potential risks have been identified and as part of your risk assessment should be investigated further.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk.**

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines
Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips
Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations
Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites
Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence
Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas
Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes
Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining
Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing
Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders
Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices
Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices
Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

The Coal Authority

Summary of findings

The map highlights any specific surface or subsurface features within or near to the boundary of the site.