



The Coal  
Authority

# Coal Mining Risk Assessment Report

**For development land at:**

Land off Ironworks Road, Tow Law, DL13 4AJ

**For proposal:**

Single two storey detached residential dwelling

Assessment Summary

Assessment Result	MEDIUM RISK
Recommended Further Work	INTRUSIVE GROUND INVESTIGATION

The Coal Authority works to resolve the impacts of mining by growing its expertise, innovation, organisational capability and efficiency.

It manages the effects of past coal mining, including subsidence damage claims which are not the responsibility of licensed coal mine operators and is an executive non-departmental public body, sponsored by the Department of Business, Energy and Industrial Strategy. This report is valid for 90 days.

#### Limit of liability

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*Any advice provided in this report does not prejudice our position as a statutory consultee.*

Version	Compiled	Checked	Date
1.1	HB	SW	20 <sup>th</sup> June 2018

## Section 1 – Description of site and proposed development

### a) Site location and Description

The Coal Authority has been commissioned to prepare a Coal Mining Risk Assessment Report for a proposed development on land off Ironworks Road, Tow Law, DL13 4AJ (see Figure 1), in order to provide the Local Planning Authority with information on coal mining and an assessment of its impact on land stability.

The approximate site centre co-ordinates are 411679E, 539049N. The proposed development area requires access via a drive leading northwest from Ironworks Road. The site has an approximate elevation of 287m AOD.

**Figure 1: Site location plan**



## b) Description and layout of proposed development

The Coal Authority understands that the developer plans to construct a single two storey detached residential dwelling (see Appendix A).

## c) Scope of 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 necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development.
- 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.

Any works that intersect coal mine workings, mine entries or coal seams may have implications for mine gas, spontaneous combustion and surface collapse. Coal Authority permission is required prior to any such works taking place. Further detailed advice can be provided upon request.

The Coal Authority's adopted policies regarding building over or close to mine entries and managing gas risks can be viewed at:

[www.gov.uk/government/publications/building-on-or-within-the-influencing-distance-of-mine-entries](http://www.gov.uk/government/publications/building-on-or-within-the-influencing-distance-of-mine-entries)

[www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases](http://www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases)

## Section 2 – Sources of information used to inform this report

Source reviewed	Yes	No	Remarks
Coal mining report	X		Non-Residential Coal Mining Consultants Report (see Appendix B)
Other mining records	X		Abandonment plans – 9368 Prospect House Colliery (Main seam), 13679 West Thornley Colliery Foundry Main Drift (Top and Main seams), 12569 1 of 3 West Thornley Colliery (Main seam) and D1282 Parkwall and Extension Opencast.
Historic OS plans		X	
Geological plans	X		OS geological sheet NZ13NW – 1973.
BGS Boreholes	X		NZ13NW109 'Tow Law RC Junior & Infant School Bore 2', NZ13NW119 'New Garage, Overdale, Villa Road 2', NZ13NW146 'Tow Law Telephone Exchange 8'.
Other	X		BGS geology viewer

The above information sources have been used to provide an assessment of the potential mining risk within the remainder of the report.

## Section 3 – Identification and assessment of site specific coal mining related risks

The Coal Authority's search of its detailed coal mining information identifies the following site specific coal mining legacy risks to the site.

Coal mining issue	Yes	No	Risk assessment	
			Rating	Comment
a) Underground coal mining (recorded at shallow depths)		X	Low risk	None recorded
b) Underground coal mining (probable at shallow depths)	X		Medium risk	Unrecorded shallow mine workings may exist in the Victoria and Marshall Green seams.
c) Mine entries (shafts and adits)		X	Low risk	None recorded
d) Coal mining geology (faults and fissures)		X	Low risk	None recorded
e) Record of past mine gas emissions or potential	X		Medium risk	All mine workings pose a potential gas risk which should be considered in any future investigations and development.
f) Recorded coal mining surface hazard		X	Low risk	None recorded
g) Surface mining (opencast workings)		X	Low risk	None recorded

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 by an experienced Coal Authority Mining Engineer. Comment on each specific coal mining issue follows below:

### a) 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 Consultant's report in Appendix B shows that the development site is not in an area of recorded shallow coal mine workings.

## b) Underground coal mining (probable at shallow depths)

Areas of probable shallow coal mine workings have been 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.

The Coal Authority Coal Mining Consultant's report in Appendix B shows that the development site is not in an area of probable shallow coal mine workings. However, the OS Geological Sheet NZ13NW indicates that the Victoria seam outcrops approximately 27m southwest of site, dipping approximately northeast beneath the site. Beyond this the Marshall Green seam is recorded to outcrop approximately 110m west of site. The generalised vertical section of the OS Geological Sheet records the Victoria seam to have a thickness of 10-20in (0.25-0.5m) and the Marshall Green seam to have a thickness of 8-18in (0.2-0.45m). Both of these seams would therefore be considered to be of a workable thickness, however it should be noted that if worked, access into workings could be taller.

The local dip in stratigraphy is not recorded on the OS Geological Sheet, however three abandonment plans for workings to the south and east of the site record dips in workings; 9368 – Main Coal seam at Prospect House Colliery (presumed to be the Brockwell and Bottom Threequarter based on the depth – the Brockwell seam is known to have a local alternative name of the 'Main' seam), 13679 – Top and Main seams: West Thornley Colliery Foundry Main Drift and 12569 1 of 3 – Main seam: West Thornley Colliery. These plans record general dips of seams/workings of 3 inches per yard (4.7°) WSW, 1 in 23 (2.5°) ENE and 1 in 30 (1.9°) NE.

Taking the shallowest of these dip rates at 1.9° in a northeasterly direction and based on the outcrops indicated on the Geological Sheet, it is estimated that the Victoria seam is present at 0.9m below rock head and the Marshall Green is present at 3.6m below rock head. It is therefore feasible that these seams could have been worked from outcrop in the local area. The underlying Ganister Clay coal, which may also be present at shallow depth beneath the site, is recorded to have a local thickness of 6-12in (0.15-0.3m) and is therefore unlikely to have been worked in isolation. The generalised vertical section on the OS Geological Sheet indicates a similar seam separation from the Victoria to Marshall Green seams and the Marshall Green to Ganister Clay seams.

Whilst abandonment plan 9368 indicates a west-southwesterly dip, it is assumed that this is a local anomaly within the workings in this locality. All other sources of information reviewed, including abandonment plans, boreholes logs and the OS Geological Sheet indicate a northeasterly dip (albeit at a shallow rate).

Plan D1282 for Parkwall and Extension Opencast, located approximately 1km southeast of the proposed development, records multiple seams to have been extracted, including the Victoria seam. Old mine workings were recorded in the Victoria seam, suggesting that this seam may have been worked elsewhere locally without records having been kept.

Based on the shallow depth of the Victoria and Marshall Green seams beneath the site, and these seams being of workable thickness, it is considered probable that unrecorded shallow mine workings may exist and therefore the risk from unrecorded shallow mine workings to the proposed development is considered to be medium. Due to its thin nature, the Ganister Clay coal is unlikely to have been worked in isolation, however if the overlying Victoria and Marshall Green seams were locally extracted at shallow depth, it is possible that the underlying Ganister Clay coal may have been extracted during the same works.

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.

#### c) Mine entries (shafts and adits)

The Coal Authority Coal Mining Consultant's report in Appendix B shows no mine entries are recorded within 100m 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.

#### d) Coal mining geology (Faults and fissures)

The development site sits upon the Pennine Lower Coal Measures, consisting of coal, sandstones, siltstones and mudstones. Local BGS borehole records indicate rockhead to be locally present at 2.5m-6.6m below ground level, with superficial deposits consisting of soils, made ground, gravel, clay and boulder clay, however actual ground conditions beneath the site may vary. Incidentally, the abandonment plan for the 'Main seam' workings approximately 70m east of site records a seam section which indicates 10ft (3m) boulder clay, overlying shale and the worked seam.

No faults, fissures or break lines are known to affect the development site.

The 'Main' seam is recorded to be present to the east of the site and in the northeast of England is known to be liable to spontaneous combustion. It is suspected that the



nomenclature of the 'Main' seam is referring locally to the Brockwell and Bottom Threquarter seams and although this seam should not be present beneath the site, due consideration should be given to the possibility of shallow seams beneath the site being liable to spontaneous combustion.

e) Record of past mine gas emissions or potential

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.

f) Recorded coal mining surface hazard

None recorded.

g) Surface mining (opencast workings)

None recorded.

## Section 4 – Proposed mitigation strategy

### a) Site investigation and/or remediation

Due to the presence of probable unrecorded shallow mine workings in the Victoria and Marshall Green seams beneath the site, an intrusive site investigation will be required. This investigation should also look to prove that the underlying Ganister Clay coal, if present beneath the site at shallow depth, has not been worked in conjunction with the above seams.

The site investigations will need to be carried out by a competent contractor, taking into account the findings of this report. The results should be interpreted by a qualified and competent person so that an appropriate remedial strategy can be developed.

Guidance on drilling or piling through coal can be found at:

[www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases](http://www.gov.uk/government/publications/guidance-on-managing-the-risk-of-hazardous-gases)

Due to the difficulties in identifying coal related gas hazards, it may be prudent to consider completing a gas risk assessment for the development site. This may recommend basic gas protection measures within the foundation design, which are resistant to permanent gases (carbon dioxide, methane, carbon monoxide) and comparable to that suggested in BR211, as commonly used to protect against radon in residential properties.

Bearing in mind the nature of the shallow workings, the most likely ground remediation / stabilisation strategy would be grout injection to fill any mine void spaces that could lead to ground instability in or around the proposed development. This strategy would have to be designed by a qualified and competent engineer and carried out by a qualified and competent contractor.

Where development is proposed over areas of coal or past coal workings at shallow depth, developers should consider wherever possible removing any remnant shallow coal. This will enable the ground to be stabilised and remove a hazard prior to construction of any foundations associated with the development. Prior extraction of surface coal requires an Incidental Coal Agreement from the Coal Authority. Further information can be found at:

[www.gov.uk/get-a-licence-for-coal-mining](http://www.gov.uk/get-a-licence-for-coal-mining)

Should coal seams be found, at or near the depth of the development's foundations, they may pose a risk of spontaneous combustion if exposed to air or may act as pathways for ground gases to reach the development. A competent engineer should be consulted if coal is encountered in, or adjacent to, the foundations of the proposed development."

Concrete, cements and renders may be susceptible to attack from elevated levels of Sulfates in the ground. The Building Research Establishment reports that most cases of Sulfate attack occur in and adjacent to coal field areas and related industrial centres. It would be prudent for the issue of Sulfate attack to be considered during the foundation design to ensure they comply with the Building Regulations 2010.

You may also wish to refer to the Construction Industry Research and Information Association (CIRIA) publication Special Publication 32 "Construction over Abandoned Mine Workings".

#### b) Coal Authority permit

Any intrusive activities, including initial site investigation boreholes and any subsequent treatment of coal mine workings/coal mine entries for ground stability purposes require the prior written permission of the Coal Authority. Application forms for Coal Authority permission and further guidance on this matter can be obtained from the Coal Authority's website at:

[www.gov.uk/get-a-permit-to-deal-with-a-coal-mine-on-your-property](http://www.gov.uk/get-a-permit-to-deal-with-a-coal-mine-on-your-property)

#### c) The development lifecycle and follow-on services

This risk assessment forms part of a much wider proposition to assist you in developing this land.

Phase 1	High-level risk overview
Phase 2	In-depth risk assessment report
Phase 3	Design of ground investigation
Phase 4	Supervision of ground investigation works

Follow on services can be requested using the details in the contacts section.

## Section 5 – Conclusions

This report has identified that the proposed development site may have been subject to past coal mining activity, namely probable unrecorded shallow mine workings in the Victoria and Marshall Green seams. The Ganister Clay coal, whilst unlikely to have been worked in isolation due to its thin nature, may also be present at shallow depth beneath the site. The risk to the site from legacy mining features is therefore considered to be medium.

Nevertheless, subject to the undertaking of appropriate site investigations and any potential necessary remedial measures as outlined in Section 4a of this report, the Coal Authority considers that the site may be made safe and stable for future development and the risk to the development reduced to low.

The recorded coal mining legacy issues present within the site do not pose any particular implications for the layout of the proposed development.

The Coal Authority advises the developer undertake a detailed Gas Risk Assessment where proposed development occurs over shallow coal reserves, as is the case here.

## Section 6 – Contacts

### **Site Investigation and Remediation Services for Developers**

Tel: 0345 7626848

To get advice on cost and design solutions for development.

### **Planning and Local Authority Liaison Service**

Tel: 01623 637 119

Email: [planningconsultation@coal.gov.uk](mailto:planningconsultation@coal.gov.uk)

Website: [www.gov.uk/planning-applications-coal-mining-risk-assessments](http://www.gov.uk/planning-applications-coal-mining-risk-assessments)

### **Surface Hazards Emergency Service**

Tel: 01623 646 333 (open 24 hours a day, 7 days a week)

24-hour number for reporting public safety hazards and incidents associated with coal mining

### **Mining Reports Service**

To purchase site specific coal mining information go to our website;

[www.groundstability.com](http://www.groundstability.com)

### **Licensing and Permitting Service**

Email: [permissions@coal.gov.uk](mailto:permissions@coal.gov.uk)

Tel: 01623 637 320

For permission to enter or disturb coal mine entries and coal seams.



## Appendix B – Non-Residential Coal Mining Consultants Report