



Geo-Environmental Consultants

COAL MINING RISK ASSESSMENT

FORMER METHODIST CHURCH, CALEDONIAN ROAD, WISHAW (SITE 1)

DATE

March 2022

CLIENT

Will Rudd Davidson Ltd.

PREPARED BY

Aisling Lee – Senior Geo-Environmental Scientist

REVIEWED BY

Hugh O Leary – Project Manager

APPROVED BY

Ian Cochrane – Senior Associate

WILL RUDD DAVIDSON LTD.

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Prepared by: Aisling Lee – Senior Geo-Environmental Scientist

Reviewed by; Hugh O Leary – Project Manager

Reviewed & approved by: Ian Cochrane – Senior Associate

Mason Evans Partnership Limited

The Piazza

95 Morrison Street

GLASGOW

G5 8BE

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EXECUTIVE SUMMARY

Mason Evans Partnership have been commissioned by Will Rudd Davidson Ltd (the Client) to undertake a Coal Mining Risk Assessment Report on a site located at Former Methodist Church, Caledonian Road, Wishaw. The site is located within an area of historical underground coal mining and, with respect to this matter, we were appointed by the Client to undertake Phase I researches of the mining conditions.

The report presents a desk-based review of available information, specifically detailing the mining conditions within the site and immediate surrounding area. The purpose of the report is to demonstrate the site is, or can be made, safe and stable to meet the requirements of national planning policy with regard to site works on potentially unstable land.

The desktop report has established the following:

- a) Natural superficial deposits were indicated to comprise of glacial till and rockhead was indicated to be at approximately 5 mbgl across the site area.
- b) The underlying rock strata were indicated to primarily belong to the Scottish Middle Coal Measures Formation.
- c) The site is indicated to be positioned between 2 No. faults orientated roughly east to west. The northern fault is indicated to be thrown to the north and the southern fault is indicated to be thrown to the south.
- d) The BSG shallow mining within 30 m of rockhead map records two historic boreholes approximately 50 m and 70 m north and west of the site respectively to have encountered old workings less than 30 m below rockhead.
- e) It was considered that there are indications of unrecorded mining in the area, not known from mine plans.
- f) There are no recorded mine entries within 100 m of the site.
- g) Our researches indicate further investigations are required to assess the potential presence of mine-workings beneath the site.

INTRODUCTION

1.1 General

Mason Evans Partnership (MEP) were commissioned by Will Rudd Davidson Ltd, to undertake ground investigations within a site called 'Former Methodist Church, Caledonian Road, Wishaw' Site 1 (P21/342/CMRA/01) in relation to the proposed development of residential properties.

1.1.1 The purpose of this Coal Mining Risk Assessment Report is to present a desk-based review of available information on the mining issues which are relevant to the site and to identify and assess the risks to the proposed development from its mining legacy. In the course of our assessments, we identify appropriate mitigation measures to address these issues, including necessary remedial works.

1.1.2 The objective of the report is to demonstrate 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 potentially unstable land.

1.1.3 This report presents the findings of our examinations of the site, which have been based on researches of available geological and mining maps, plans and other records. The scope of the investigations has been restricted to fulfil the necessary enquiry regarding the mining context of the site alone.

1.2 General Methodology

1.2.1 As described, our examinations involved researches of various published documents on the geological and historical background to the site, as well as reference to the British Geological Survey on-line maps, a Coal Authority report on past mining in the area, and mine abandonment plans. In assessing the potential site impacts, we considered typical mine stability assessments criteria and have reviewed the area relative to our expectations of the geological conditions. Our confidence on the geology and the potential impacts of mining are discussed relative to the quality of the data available to us, with recommendations provided on the scope of future intrusive investigations.

1.3 Context

1.3.1 It should be recognised that the report is prepared in accordance with current recommended practice and existing legislation. It is written in the context of the proposed residential development described.

2.0 SITE LOCATION AND DESCRIPTION

2.1 Site Details

2.1.1 The summary details of the site as understood from supplied survey information and reconnaissance are as follows:

- Existing Site Name - Former Methodist Church
- Local Authority - North Lanarkshire Council
- Approximate Site Area - 0.14 Ha approximately
- Grid Reference - 279540, 654910
- Location - The study area is located at 98 Caledonian Road, Wishaw.
- Current and Past Usage - The site has been occupied by a church since at least 1860 with a hall extension to the rear from around 1956.
- Topography - Generally flat
- Surface Conditions - Church and hall demolished with made ground present in the east half of the site. Soft landscaping in the west of the site

2.2 Local Context

2.2.1 The context of the site is indicated in Plate 1.

Plate 1: Aerial photograph from 2021 (courtesy of Google Maps) showing the site.



3.0 HISTORICAL BACKGROUND

3.1 General

3.1.1 An examination of the past history of a site can often provide valuable information in relation to potential constraints to its development. In this particular instance, our focus has been to establish evidence of any mining within the site or its immediate environs. To facilitate these investigations, past copies of Ordnance Survey maps were examined. It should be noted that considerable periods elapsed between successive Ordnance Survey map editions and the possibility that mining activities took place on the land in the intervening years and were not therefore recorded by the maps, cannot be discounted. In these circumstances, while we have tried to ascertain the complete record of the site history, the possibility that historical mining activities took place but were undisclosed by our researches, cannot be discounted.

3.2 Historical Background

3.2.1 During the course of our assessments, we examined Ordnance Survey and other map records dating back to the middle of the Nineteenth Century (copies included in Appendix A).

3.2.2 From the earliest edition of Ordnance Survey maps available to us, dated 1860, **the study area** was shown to be occupied by a church in the east and undeveloped soft landscaping in the west. By the time of the 1956 – 1957 map, a hall had been built onto the back of the church. The site had remained relatively unchanged up to 2021, when the church and hall were demolished.

3.2.3 **The surrounding area** of Wishaw was recorded to be developed with residential, commercial and industrial buildings. A number of coal pits, quarries and collieries were recorded in the surrounding area from 1860 to around 1940. The closest recorded coal pit and quarry were recorded approximately 220 m and 310 m northwest of the site respectively, The coal pit was no longer recorded by 1897, and the quarry was labelled as old by 1912. Heathery Coal Pit No. 2 was recorded approximately 800 m northwest of the site from 1898 to 1938 -1940. Glenpark Coal Pit was recorded approximately 460 m north of the site from 1913 to 1938-1940 when it was replaced by Belhaven Park. Three small unlabelled pits were recorded approximately 95 m to 135 m northwest of the site from 1956 to 1966 – 1973 map.

3.2.4 In conclusion, the site was occupied by a church from 1860, with a hall developed behind the church from 1958-1957 until late 2021, when the buildings were demolished. The surrounding area has been developed with residential and commercial buildings and has a large industrial history. The surrounding area has also recorded various coal pits, quarries, air shafts and collieries.

4.0 SITE GEOLOGY AND MINING

4.1 General

4.1.1 The published geological maps of the site area indicate that the superficial material at the site is likely to be glacial till approximately 5 m thick. The rock strata is indicated to belong to the Carboniferous aged Scottish Middle Coal Measures Formation, which were characterised by cyclic sedimentary sequences of interbedded sandstones, siltstones, mudstones, seatearths and economic coals, many of which were economically viable, and noted to have been worked. The strata are indicated to dip to the south. (Drawing No P21/342/CMRA/03).

4.1.2 The British Geological Survey (BGS) solid geology map indicates that the site lays between 2 No. faults orientated roughly east to west. The northern fault is indicated to be thrown to the north and the southern fault is indicated to be thrown to the south.

4.1.3 The BGS shallow mining map does not indicate that the site or the surrounding area is within an area of underground mining for coal or ironstone, known from mine plans and estimated to be less than 30 m below rockhead. However, the map does indicate that **2 No. historic boreholes located approximately 50 m and 70 m north and west of the site respectively, encountered old working less than 30 m below rockhead.** Therefore it is considered that there are indications of unrecorded mining in the area, not known from mine plans.

4.2 Historical Boreholes

4.2.1 There are several available BGS historical borehole logs in the surrounding area, but none within the site boundaries.

- Historical boreholes NS75SE5253/2 and NS75SE9724/33 dated 1983 located approximately 40 m northwest of the site records Main Coal at 11.76 m to 13.25 mbgl, and 13.25 m to 13.40 mbgl underlain by sandstone to 14.60 mbgl where the borehole was terminated.
- Historical borehole NS75SE9724/5 dated 1977 located approximately 40 m northwest of the site records that coal was encountered at 5.30 m to 5.40 mbgl and Main Coal was encountered at 12.08 m to 13.96 mbgl, underlain by sandy fireclay to 14.96 mbgl where the borehole was terminated.
- Historical boreholes NS75SE5253/3 and NS75SE5253/4 dated 1983 located approximately 40 m northwest of the site records that coal was encountered at 5.20 m to 5.40 m and again at 12.30 m to 13.75 m (conjectured to be Main Coal), underlain by sandstone to 14.80 mbgl where the borehole was terminated.
- Historical borehole NS75SE9724/17 dated 1986 located approximately 75 m west of the site records that coal was encountered at 9.25 m to 12 mbgl, 18.95 to 19.60 mbgl and again at 19.60 m to 19.90 mbgl (conjectured to be Main Coal), underlain by sandstone to 21.15 mbgl where the borehole was terminated.

4.3 Geological Mining Memoirs

4.3.1 Review of the geological memoirs from the BGS indicate that the Ell Coal, Pyotshaw Coal, Main Coal, Humph Coal and Splint Coal have all been worked in the surrounding area. The Thornlie Colliery approximately 500 m south of the site is recorded to have worked Ell, Main and Splint Coal seams. A summary of the seam information presented in the geological memoirs is presented below;

- The Splint Coal is recorded to have been worked extensively in Wishaw, however large stoops of considerable size are recorded to have been left in place as supports or abandoned due to difficult mining. The Thornlie Colliery approximately 500m south of the site is recorded to have worked Splint Coal.
- The Humph Coal is recorded to lay between the strata of the Splint and Main coal and is indicated to be variable in thickness. There is one bore in Wishaw (no exact location provided) in which Humph coal is recorded to be 14 inches thick, however elsewhere the seam is recorded to have no economic value.
- The Main and Pyotshaw Coals are recorded to have been worked at the Thornlie Colliery and the Sunnyside Colliery approximately 500 m south and 1.5km to the north of the site respectively.
- The mining memoirs dated 1920 state that in the Wishaw area the Ell Coal averages between 2.23 m to 2.75 m thick. The memoirs also state the Ell Coal must be regarded as being exhausted within the Wishaw field, although possible local areas of the seam may remain where it was considered difficult to work. It is indicated that there was a common practice of leaving the top 0.90 m to 1.20 m of the Ell seam in place and unworked. The Ell seam was recorded to have been worked in the Thornlie and Wishaw Collieries and the Sunnyside Pit/ Heathery Pit approximately 880 m northwest of the site.

4.4 Coal Authority

4.4.1 The Coal Authority Interactive Map indicates that the site is within a surface coal resource area, **probable shallow coal mine working area** and borders a development high risk area immediately north and northwest of the site. The Coal Authority Consultants Coal Mining Report indicates that there was no past underground mining recorded, however there are **probable unrecorded shallow workings**. There are no records of coal outcrops on the site or mine entries within 100 of the site.

4.4.2 The Coal Authority Mining Report recorded a number of abandoned mine catalogue numbers thought to intersect with some or all of the site boundary. However, upon contacting the Coal Authority it was concluded that there are no abandoned mine plans for the site or immediate surrounding area '*due to there being no mine entries or past underground mining that intersects with the site*'.

4.5 Summary

4.5.1 In summary, the Ell, Main, Pyotshaw, Humph and Splint Coals are all recorded to have been worked in the wider surrounding area. The shallow mining plans of the site do not record shallow workings within 30 m of rockhead, however bores approximately 50 m and 70 m north and west and west of the site respectively recorded old working less than 30 m below rockhead. The Coal Authority Interactive Map indicates that the site is just out with the boundary of the Development High Risk Area. Given the above, we consider that further investigation into the geological conditions beneath the site will be required to confirm the risk (if any) of instability due to mine workings.

4.6 Mining Methods

- 4.6.1 The methods of mining historically adopted in the area were the 'stoop and room' and 'longwall' systems of extraction. The stoop and room mining operations involved partial excavation of the mineral, with the seam recovered from 'rooms' and the roof supported by retained 'stoops' or 'pillars' of mineral. The pillar or stoop widths varied depending on the depth and the condition of the roof, but stoops could range up to around 4.0m square, with roadways often around 2.0m wide.
- 4.6.2 In the 'longwall' method of mining, extraction was virtually total with the seam face accessed via supported roadways. In the areas from which the seam had already been removed, the roof was generally allowed to collapse behind the face, or was partially supported by spoil or 'waste' deposited within the works. While the workings would be generally closed on abandonment with the withdrawal of roof support, roadways would be expected to remain open and artificially supported long after the operations had ceased. A variation of the longwall method is the technique commonly used in deep mining today but was generally only applied to the recovery of ironstones or coals of restricted thickness in the 19th century.

4.7 General Principles of Surface Instability

- 4.7.1 It is generally accepted that old abandoned mineworkings are susceptible to collapse. This is typically the consequence of on-going deterioration within the mines and failure can occur a considerable time after abandonment. The mechanisms of collapse are varied and complex, but generally involve either a yield in the roof of the mine between supports, or collapse as a direct result of failure of the supports. Except in instances where the mineworkings are very shallow for example, less than 10 m deep, the stability is comparatively unaffected by enhanced loadings from buildings or by vibrations from heavy traffic. Progressive deterioration within the workings can, however, advance to a stage where instability is reached and collapses occur. In most cases, however, it is impossible to predict with any degree of accuracy if, and when, such movements will take place.
- 4.7.2 Subsidence assessments generally consider various elements of the geological and mining configuration. These include the nature and thickness of the rock and soil overburden, the extracted height of the workings and the typical mine configuration. Assessments typically seek to achieve a rock/overburden cover thickness of 10 times the seam extraction height. This is consistent with a number of recent studies in the field of mining stability assessment.

4.8 Surface Instability Due to Mining

- 4.8.1 The Ell, Main, Pyotshaw, Humph and Splint Coals are all recorded to have been worked in the wider surrounding area. The shallow mining plans of the site do not record shallow workings within 30 m of rockhead, however bores approximately 50 m and 70 m north and west of the site respectively recorded old working less than 30 m below rockhead. There are no logs available of the bores which recorded old shallow workings and as such it cannot be determined how thick the workings are and if there is sufficient bedrock coverage to mitigate against surface instability. The Coal Authority Interactive Map indicates that the site immediately borders a Development High Risk Area to the north. This information is at the moment conjectured, and further investigation into the geological conditions beneath the site will be required to confirm the risk (if any) of instability due to mineworkings.

4.8.2 We would recommend in the first instance that probe holes are sunk to confirm the depth and evidence of mineral extraction for the aforementioned seams across the site. Should these probe holes confirm the presence of shallow mining within influencing depth beneath the site, stabilisation by drilling and grouting will be required to allow development.

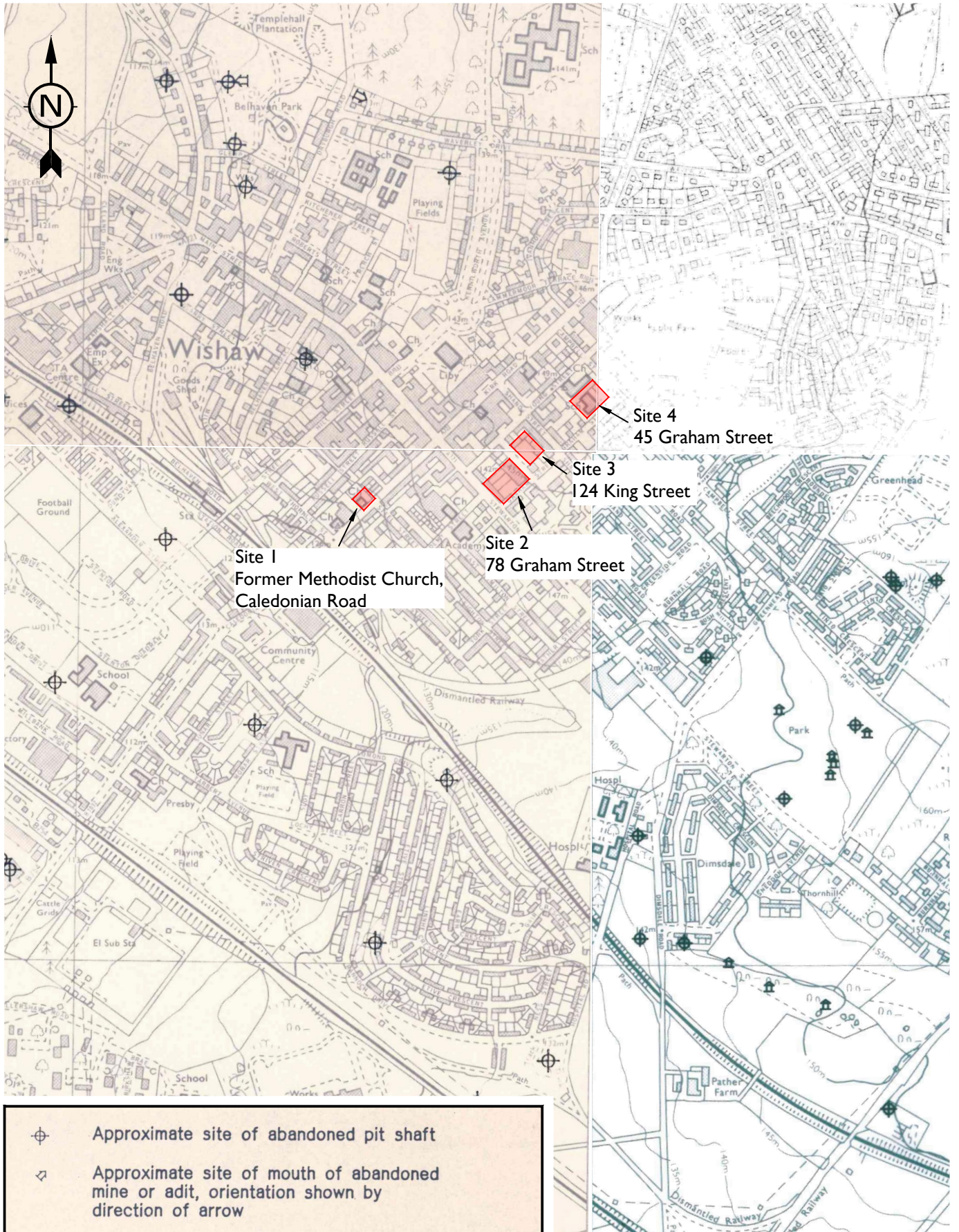
4.9 **Mine Entries**

4.9.1 As described, no mine entries were recorded within the site, or within 100 m of the site. It is therefore considered that mine entries would present a low risk to the site.

4.9.2 As in every area of former mining, the possibility that unrecorded shafts exist undetected cannot be excluded.

4.10 **Potential for Future Mineral Extraction**

4.10.1 We would advise that we have not carried out detailed research of the potential for future resource extraction beneath or within close proximity of the site. While we consider the likelihood of future extraction remote, the mineral ownership should be checked by the client's legal advisors.



Geo-Environmental Consultants

t: 0141 420 2025 e: mail@masonevans.co.uk

The Piazza, 95 Morrison Street, Glasgow, G5 8BE

client details:

WILL RUDD DAVIDSON Ltd
100 BRUNSWICK STREET
GLASGOW, G1 1TF

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WISHAW

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EXTRACT FROM PUBLISHED
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5.0 IDENTIFICATION AND ASSESSMENT OF SITE SPECIFIC MINING RISKS

5.1 Risk Assessment

- 5.1.1 Table I has been derived from the researches, highlighting the risk relating to shallow mineworkings at the property. The risk is shown by the colouration in the boxes. Where red is shown, the risk is heightened and mitigation would be expected to be required for development. An 'orange' colouration indicates a suspicion of a potential risk that would need to be addressed in investigations and/or design, with a possible need for mitigation. Where there is a 'green' colouration, no significant risk is expected.

Mining Issue	Yes	No	Risk Assessment
Underground coal, ironstone and limestone mining (unrecorded shallow mining and possibly other, deeper seams)			The Ell, Main, Pyotshaw, Humph and Splint Coals are recorded in memoirs to have been worked in this district. Surface instability from workings in shallow seams cannot be discounted without intrusive investigations.
Mine entries (shafts and adits)			No records of mine entries on site or within 100 m of the site boundary.
Coal mining geology (fissures, faults, break lines)			A fault is recorded in the northeast corner of the site.
Record of past mine gas emissions			No records of past gas emissions.
Recorded coal mining surface hazard			No mine entries recorded within the site
Surface mining (opencast workings)			No surface mining recorded on site or within the immediate surrounding area.

- 5.1.2 Results of the review of mining memoirs and the BSG shallow mining map which records old shallow workings within 50 m and 70 m north and west of the site respectively, indicate that the site is at risk of mining in potentially shallow coal seams. No mine entries were recorded within the site or within the immediate surrounding area.

5.2 Mitigation Strategy Proposed

- 5.2.1 In view of the recorded geology and the conjectured mining conditions at the site, we recommend that probe drilling is undertaken across the site in order to ascertain whether working has been taken place at this locale and, if so, whether rock cover is sufficient to mitigate the associated risk at the surface. Should this identify that the site is at risk from surface instability, any proposed buildings constructed within the conjectured zone of instability should be protected by the implementation of drilling and grouting works to consolidate the workings. Stability measures will not be required in the car parks and open-space areas, but would be necessary for adoptable roads as this is a prerequisite of Local Authority adoption. With regard to any open areas, we would highlight that whilst mining may have taken place in these areas, the typical movements that may be expected should not present any significant health and safety risks to users. The exception would be where unrecorded mine entries collapse. In our experience, such work can be undertaken economically to facilitate residential development and a number of such sites have been similarly treated in the past.

- 5.2.2 We consider that the development can proceed with due cognisance of the above investigation and mitigation proposals. As highlighted, vigilance should be maintained during site works for any unrecorded mine entries. Where such features exist these should be secured by grouting and/or capping.
- 5.2.3 Prior to the commencement of any investigations or treatment in coal mining areas, permission will be required from the Coal Authority to penetrate the seam. This is a standard requirement in all mining investigations where seams of coal may be entered or disturbed.

We trust this meets with your current requirements. However, if you require any further information, please do not hesitate to contact us.



Aisling Lee
Senior Geo-Environmental Scientist



Ian Cochrane
Senior Associate