



EARTH ENVIRONMENTAL
& GEOTECHNICAL

Coal Mining Risk Assessment

Ffordd Dinas

Cwmavon

April 2021

On behalf of

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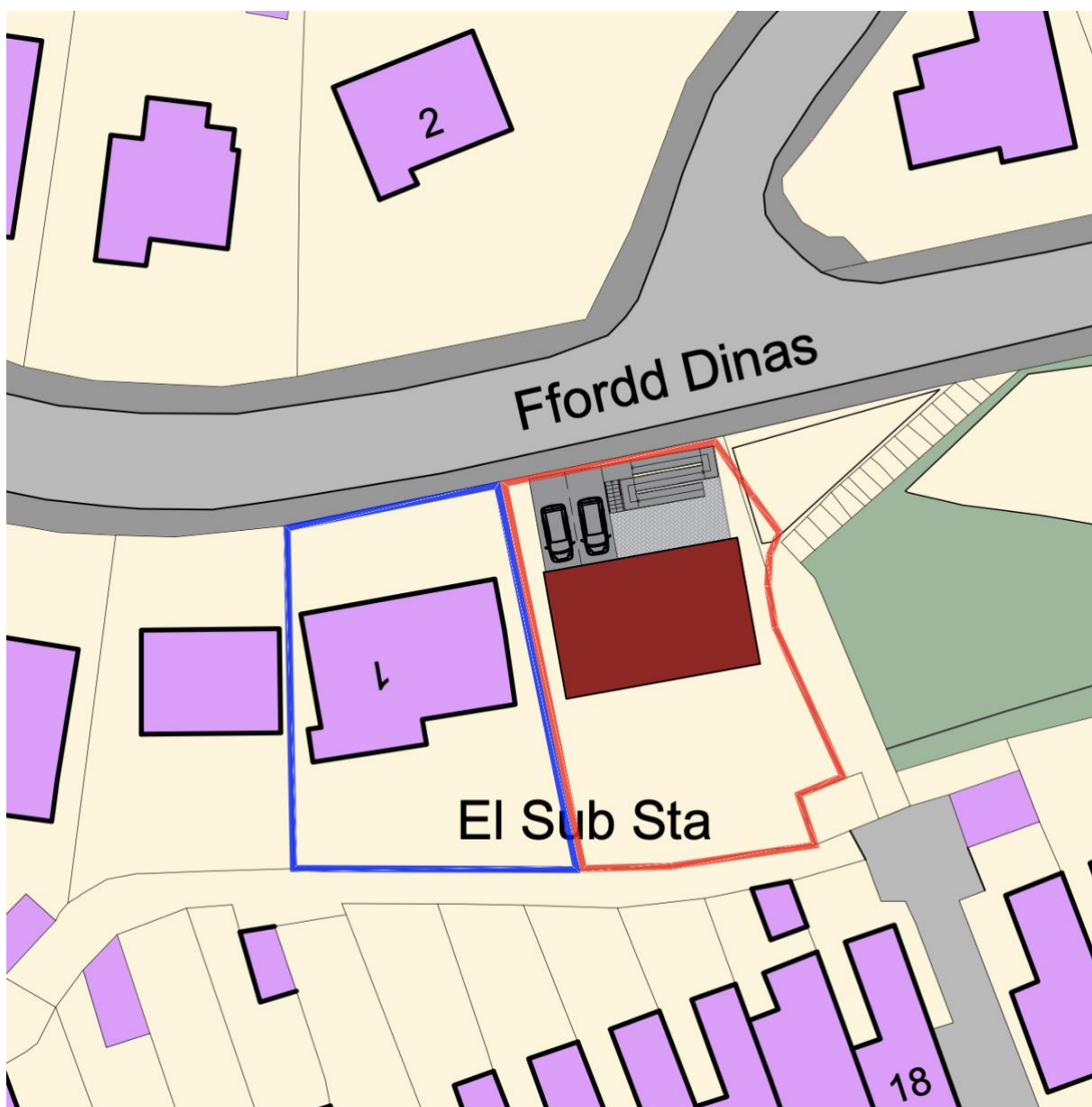
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1.0 INTRODUCTION

Appointment

- 1.1 Earth Environmental & Geotechnical Ltd have been commissioned by Darkin Architects on behalf of Mr. Williams (the Client), to undertake a Coal Mining Risk Assessment for a proposed development on land adjacent to Plot 1 Ffordd Dinas, Cwmavon.
- 1.2 It is understood that the Client is seeking planning permission for the construction of one three-storey (with a basement) detached dwelling.
- 1.3 A proposed development plan has been provided and is shown as Figure 1.

Figure 1 Proposed Development Plan



- 1.4 This Coal Mining Risk Assessment is required to accompany a planning application to Neath Port Talbot Council.

Objective

- 1.5 The purpose of the Coal Mining Risk Assessment is to collate available geological, mining and historical data in order to assess the potential for the site to be affected by underground mining.
- 1.6 This report has been drafted in accordance with the Coal Authority (CA) Guidance Risk Based Approach to Development Management, Version 4, 2017.

Sources of Information

- 1.7 The Coal Mining Risk Assessment compiles a review of the following information sources:
- British Geological Survey of England, Swansea Sheet 247, 1/50,000, 2011 edition.
 - British Geological Survey of England, Sheet SS79SE, 1/10,560, 1970 edition.
 - Coal Authority Interactive Map Viewer.
 - Coal Authority Mining Report.
 - British Geological Survey online borehole records.
 - Google Earth imagery.
 - Online Historical Ordnance Survey maps.
 - Site Investigations in Areas of Mining Subsidence, FG Bell, 1975.
 - The threat of abandoned mines on the stability of urban areas, Barry Clarke, IAEG2006 Paper Number 379, The Geological Society of London, 2006.
 - The collapse of shallow coal mine workings, Durham theses, Durham University, Garrard, 1981.
 - Construction over abandoned mineworking's, CIRIA Special Publication 32, 2002.
 - Abandoned Mineworking's Manual, CIRIA 2019.
 - Neath Port Talbot Council planning portal.
 - CON29M Coal Mining Report, 12th March 2021.
 - Blandford Consulting, Mining Risk Assessment, Tabernacle Court, Cwmavon, 2017.

2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site is located approximately 141m north of Cwmafon village centre and lies at an elevation of 55mAOD (centre of site). The approximate National Grid Reference for the centre of the site is SS 77753 92220 with the closest postcode being SA12 9BS.
- 2.2 A location plan is shown below as Figure 2 together with an aerial photograph as Figure 3 (overleaf).

Figure 2 Site Location Plan

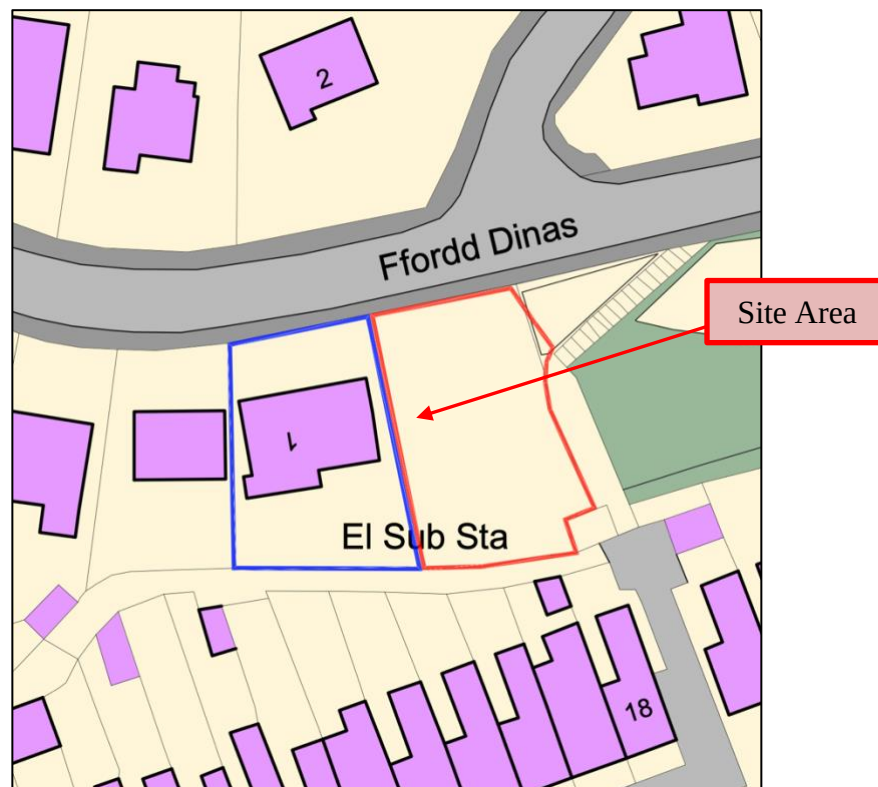


Figure 3 Site Photograph



3.0 ASSESSMENT OF DATA

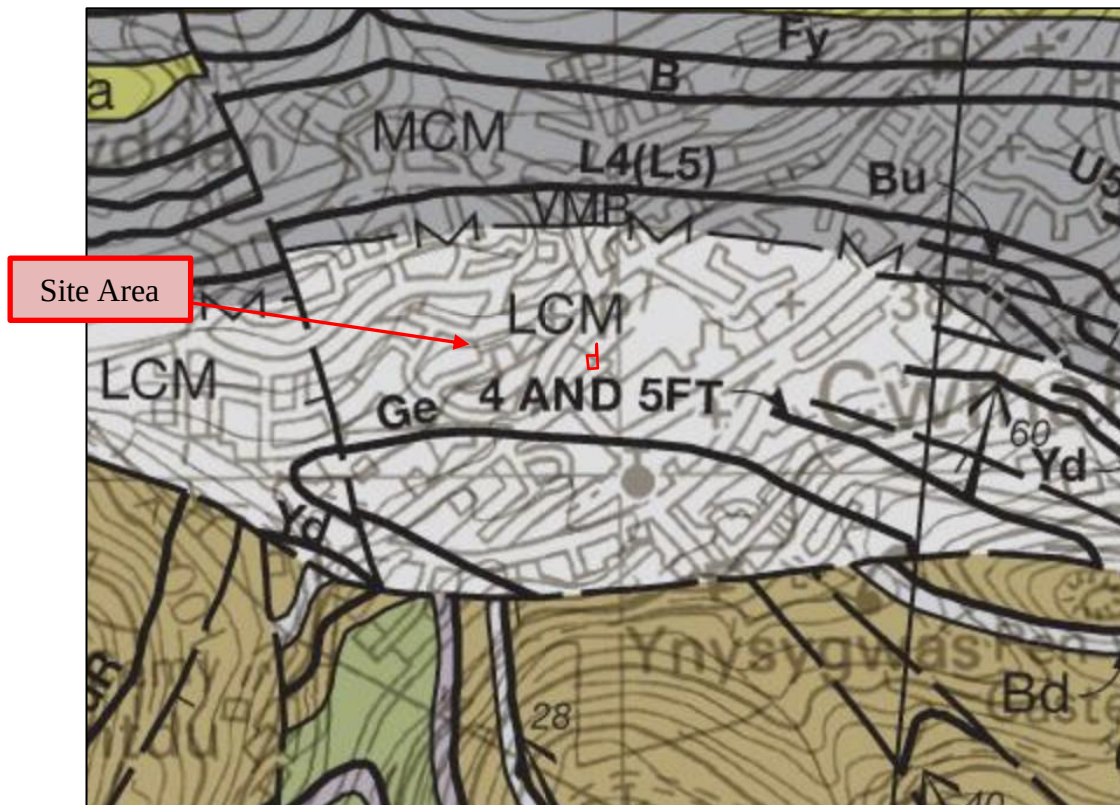
Geological Information

- 3.1 The geology of the site has been determined from geological maps for the area and examination of Coal Authority (CA) records.

British Geological Survey Published Data Assessment

- 3.2 The site is underlain by superficial deposits of Devensian Till, comprising Diamicton, commonly known as Boulder Clay.
- 3.3 The solid geology beneath the site is shown to be the South Wales Lower Coal Measures Formation consisting of cycles (cyclothems) of coal seams, sandstone, mudstone, siltstone and seatearth.
- 3.4 There are no BGS borehole records that allow for further assessment of the local geology or shallow coal mining regime.
- 3.5 An extract from the most recently published geological map showing the approximate site location and key local geological features are presented below in Figure 5.
- 3.6 The regional dip of strata within the area is sixty degrees to the north.

Figure 4 Geology Map Extract



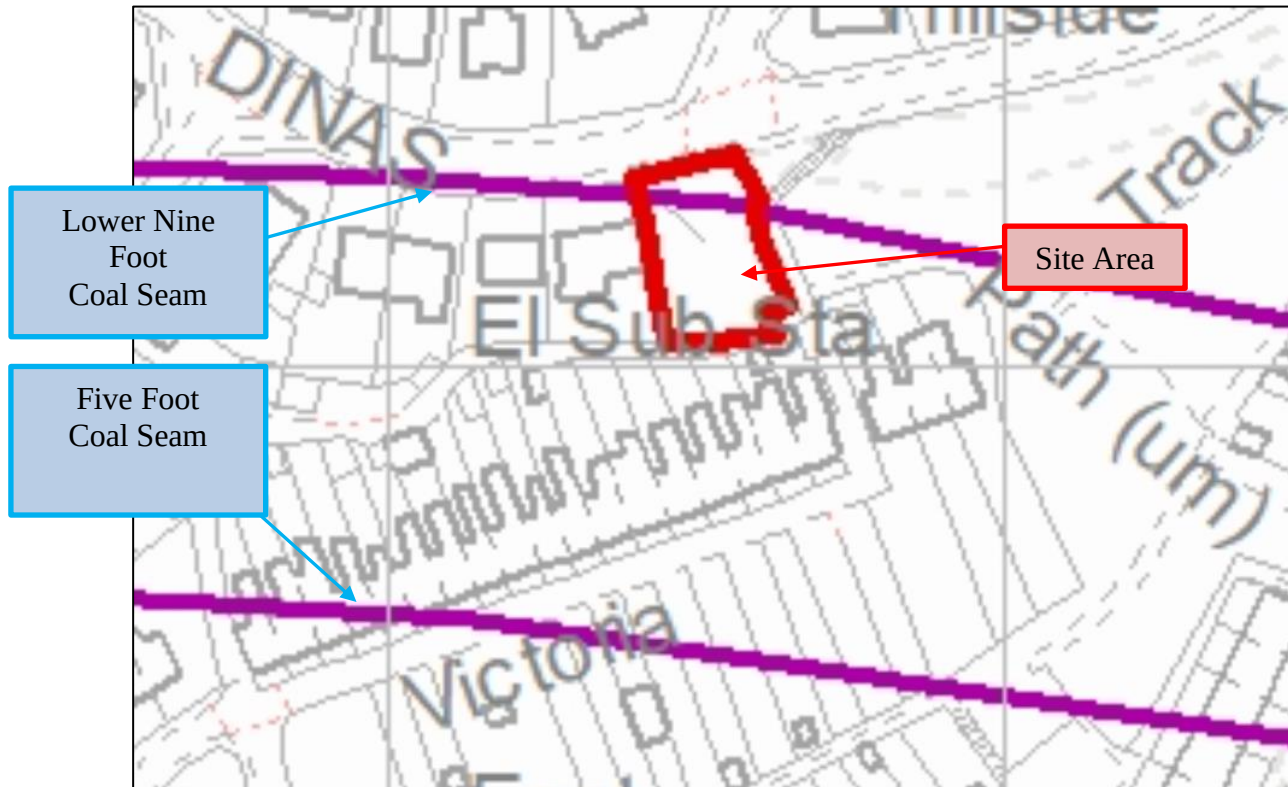
DUC	MCM	BIG (B) or SIX-FEET
	U9	RED
	Bu	UPPER NINE-FEET
	M	LOWER NINE-FEET
	M	BUTE
	M	Vanderbeckei (Amman) Marine Band
	M	AMMAN RIDER
	Yd	YARD
	M7	MIDDLE SEVEN-FEET
		LOWER SEVEN-FEET
		UPPER FIVE-FEET
	Ge	GELLIDEG or CRIBBWR FAWR

Coal Authority Records

- 3.7 Reference to the Coal Authority Online Interactive viewer shows the site to be located within a Development High Risk Area and within an area of Probable Shallow Coal Mine Workings.
- 3.8 A Coal Authority Mining Report (extract shown as Figure 5) has been acquired for the site and reveals that there are no proven records of past underground mine workings beneath the site.
- 3.9 To the north of the site the Lower Nine Foot (Top Leaf) coal seam was worked at a depth of 18m in 1900. The coal seam dips at eighteen degrees to the north.

- 3.10 The Coal Authority report suggests that there are probable unrecorded shallow workings beneath the site.
- 3.11 The Lower Nine Foot (Top Leaf) coal seam outcrops on the site and is noted to be workable.
- 3.12 There are no records of any managed tips, remediated sites, areas of coal mining subsidence within 50m of the site.

Figure 5 Coal Authority Map Extract



Historical information

- 3.13 The available historical plans dating back to 1877 show no mining features on the site or in the general area.

4.0 COAL MINING RISK ASSESSMENT

Scope of Coal Mining Risk Assessment

- 4.1 Objectives of the coal mining risk assessment are to provide a desk-based assessment of available geological and mining information relating to the site (and wider area) and to use this information so as to identify risks present to the development from the legacy of mining.
- 4.2 As part of the risk assessment, potential mitigation measures (if required) should be considered, including any necessary remedial works.
- 4.3 The outcome of the risk assessment should demonstrate to the Local Authority that the proposed development is or can be made safe (and stable) to meet the requirements of the National Planning Policy Framework (NPPF).

Data Limitations

- 4.4 It should be appreciated that it did not become a legal requirement to deposit coal mining abandonment plans until the 1870's and that this requirement was not rigorously enforced for some time after. Many shallow coal seams were worked prior to the introduction of first edition Ordnance Survey Maps and information on these workings is often not available. Therefore, if coal seams were accessible then there is the potential that they could have been worked by formal or informal means.
- 4.5 It is also possible that if unrecorded workings are present then unrecorded mine entries may be present.

Coal Mining Risks

- 4.6 The risks associated with coal mining are as follows:
 - Collapse of relict workings beneath buildings causing damage to the building fabric and infrastructure.
 - Migration of mine gases from old mine workings and mine entries resulting in accumulation of flammable and asphyxiating gases in confined areas.
 - Consolidation of relict workings and overlying strata causing structural defects in building fabric and infrastructure.
 - Failure of mine entries causing loss of ground beneath building and external areas.
 - Spontaneous combustion of old mine workings.

Conclusions

- 4.7 The development area lies within a Coal Authority Development High Risk Area and within an area of probable shallow workings due to locally outcropping coal seams.
- 4.8 The Lower Nine Foot coal seam outcrops on the site and was formerly mined at a shallow depth to the north. The coal seam dips to the north at an angle of eighteen degrees from the horizontal.

Proposed Mitigation Strategy

- 4.9 There is a risk to the development from unrecorded shallow coal mining activity beneath the site.
- 4.10 It would therefore be prudent to conduct a ground investigation across the site in order to determine the presence or absence of unrecorded shallow mine workings. Two boreholes should therefore be drilled to a depth of 30m below ground level.
- 4.11 The drilling of boreholes will require a permit from the Coal Authority together with the development of a risk assessment and method statement.
- 4.12 This report should allow for planning permission to be granted with relevant conditions.

APPENDIX 1

COAL AUTHORITY MINING REPORT

APPENDIX 2

REPORT LIMITATIONS

REPORT LIMITATIONS

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The services are based upon Earth Environmental & Geotechnical Ltd observations of existing physical conditions at the site gained from a walkover survey of the site together with Earth Environmental & Geotechnical Ltd interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The findings and recommendations contained in this report are based in part upon information provided by third parties, and whilst Earth Environmental & Geotechnical Ltd have no reason to doubt the accuracy and that it has been provided in full from those it was requested from, the items relied on have not been verified.

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Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. Ground conditions can also be variable and as investigation excavations only allow examination of the ground at discrete locations. The potential exists for ground conditions to be encountered which are different to those considered in this report. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition, chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and Earth Environmental & Geotechnical Ltd] based on an understanding of the available operational and historical information, and it should not be inferred that other chemical species are not present.

The groundwater conditions entered on the exploratory hole records are those observed at the time of investigation. The normal speed of investigation usually does not permit the recording of an equilibrium water level for any one water strike. Moreover, groundwater levels are subject to seasonal variation or changes in local drainage conditions and higher groundwater levels may occur at other times of the year than were recorded during this investigation.

Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan but is (are) used to present the general relative locations of features on, and surrounding, the site.