



**EARTH ENVIRONMENTAL
& GEOTECHNICAL**
A Technics Group Company

Coal Mining Risk Assessment

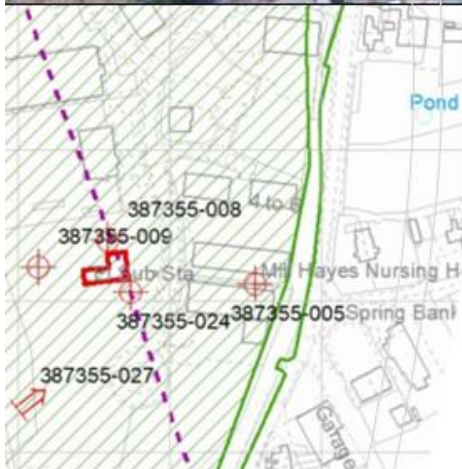
Victoria Business Park

Knypersley

February 2026

On behalf of

Portakabin Ltd



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COAL MINING RISK ASSESSMENT

VICTORIA BUSINESS PARK

KNYPERSLEY

FOR

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1.0 INTRODUCTION

Appointment

- 1.1 Earth Environmental & Geotechnical Ltd have been commissioned by Portakabin Ltd, the client, to undertake a Coal Mining Risk Assessment for a proposed development at Victoria Business Park, Knypersley.

Proposed Development

- 1.2 It is understood that the Client intends to install two Portakabin buildings, one office and one toilet block.
- 1.3 A proposed development plan for the site is shown in Figure 1, overleaf.

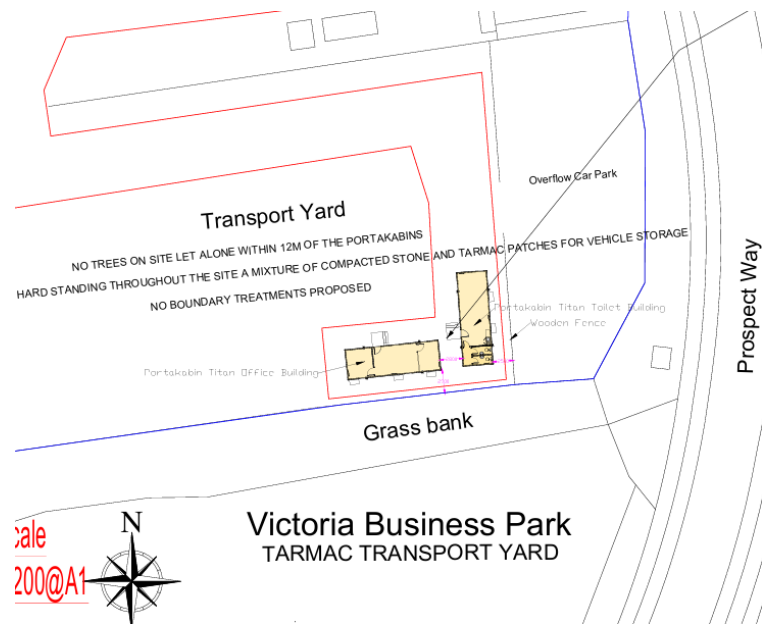
Objective

- 1.4 The purpose of the Coal Mining Risk Assessment is to collate available geological, mining, and historical data to assess the potential for the site to be affected by underground mining.
- 1.5 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

- 1.6 The Coal Mining Risk Assessment compiles a review of the following information sources:
- Staffordshire Moorlands District Council planning portal.
 - British Geological Survey of Great Britain, SJ85NE, 1:10,560 series 1992 edition.
 - British Geological Survey of England and Wales, Sheet 110, Macclesfield, 1:63,360 series 1997 edition.
 - Google Earth imagery.
 - British Geological Survey online borehole records.
 - Coal Authority Interactive Map Viewer.
 - Coal Authority Consultants Mining Report.
 - 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.
 - British Geological Survey, "GeoIndex," [Online]. Available: <http://mapapps2.bgs.ac.uk/geoindex/home.html>.
 - The collapse of shallow coal mine workings, Durham theses, Durham University, Garrard, 1981.
 - National Library of Scotland, British Geological Survey Scotland, <https://maps.nls.uk/>

Figure 1 Proposed Development Plan



2.0 SITE LOCATION AND DESCRIPTION

- 2.1 The site is located on land adjacent to Prospect Way, Knypersley, with an approximate National Grid Reference for the centre of the site of SJ 87862 55328 (X: 387862, Y: 355328) and postcode ST8 7PL.
- 2.2 The site is an L-shaped parcel of land which comprises compact gravel (100%) and is approximately 0.03 hectares in size.
- 2.3 The site is currently used as a part of a larger holding area for transport trucks and is open to the north and west and bound by a fence to the east and a grass bank to the south.
- 2.4 Offsite to the north, east and west are the further holding areas for transport trucks. To the south is another industrial site, with further industrial units to the north and east, and fields to the west.
- 2.5 The topography of the site is relatively flat, with the surrounding area sloping to the southwest.
- 2.6 A location plan is shown below as Figure 2, together with a site photograph as Figure 3 (overleaf).

Figure 2 Site Location Plan



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 BGS states that the site is underlain by artificial deposits associated with a former opencast quarry.
- 3.3 The site is underlain by superficial deposits of Devensian Till, which generally comprises unsorted and unstratified drift, is generally over-consolidated, consisting of a heterogeneous mixture of clay, sand, gravel and boulders, varying widely in size and shape.
- 3.4 The bedrock geology beneath the site is shown to be the Pennine Middle Coal Measures, generally comprising interbedded sedimentary rock cycles of mudstone, siltstone, sandstone with or without coal, and seat earths.
- 3.5 An extract of the most recently published BGS Map SJ85NE showing the approximate site location and key local geological features is presented in Figure 3. The BGS Map indicates that the local strata dip to the southwest at 30 degrees from the horizontal.
- 3.6 The geological map shows Hard Mine coal seam outcropping at a distance of 532m east of the site and dipping below the site.
- 3.7 The geological map shows the Holly Lane coal seam outcropping at a distance of 356m east of the site and dipping below the site.
- 3.8 The geological map shows Bowling Alley coal seam outcropping at a distance of 232m east of the site and dipping below the site.
- 3.9 The geological map shows the Ten Feet Mine coal seam outcropping at a distance of 90m east of the site and dipping below the site.
- 3.10 The geological map shows Bellringer coal Seam outcropping directly beneath the site.
- 3.11 The geological sequence below the site is as follows;

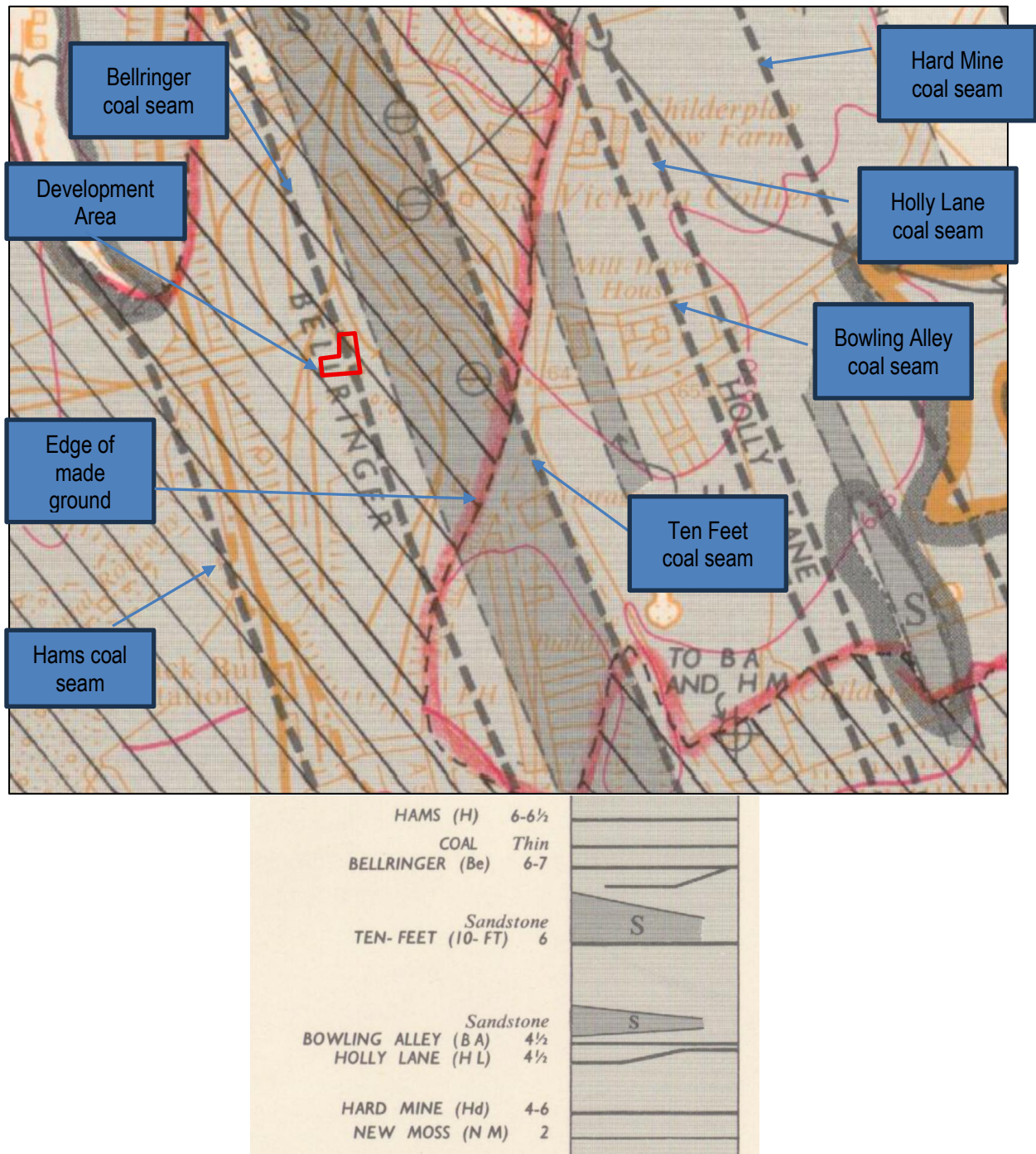
Bellringer coal seam (1.83-2.13m thick)

Ten Feet coal seam (1.83m thick)

Bowling Alley coal seam (1.37m thick)

Holly Lane coal seam (1.37m thick)

Figure 3: Geology Map Extract



- 3.12 There are several borehole records in the local area to provide information on the geology, as shown in Figure 4, and are summarised in Table 1.
- 3.13 The boreholes indicate a shallow rock layer to the north and east of the site, between 0.68 m and 1.82m and a deep rockhead of between 11.35m and 16.15m.

Table 1: Summary of BGS Boreholes

Location	Total Depth (m)	Rockhead Depth (m)	Coal Seam Depth/Thickness (m)	Comments
SJ85NE1	444.39	1.82	4.44 (1.45)	Ten Feet
			6.10 (0.38)	
			60.88 (1.20)	Bowling Alley
			73.93 (1.37)	Holly Lane
			111.22 (1.37)	Hard Mine Coal
			122.04 (1.22)	
			137.59 (0.61)	
			174.19 (0.51)	
			232.56 (2.0)	7t Bandbury
			289.71 (2.59)	Cockshead Coal
			419.91 (1.01)	Winpenny Coal
SJ85NE2	197.63	0.68	11.63 (1.96)	Ten Feet Coal
			68.09 (1.22)	Magpie Coal
			80.29 (1.22)	Holly Lane Coal
			117.88 (1.45)	Hard Mine Coal
			124.18 (1.04)	Muck RCW Coal
			139.90 (0.381)	-
			140.20 (0.229)	
			177.39 (0.356)	
			180.23 (0.178)	-
SJ85NE3			190.29 (0.66)	Ironstone Coal
			No Logs	
SJ85NE39	298.39	16.15	36.88 (1.524)	Bellringer
			71.32 (2.13)	Ten Feet Coal
				Missing core down to 244m bgl
SJ85NE117	13.00	11.35	-	Drilled 15/11/85

Figure 4: BGS Borehole Location Plan



Coal Authority Records

- 3.14 Reference to the Coal Authority Online Interactive viewer shows that the development area is located within a Development High Risk area and an area of Shallow Unrecorded Probable Workings.
- 3.15 The Coal Authority Mining Report identifies 4no. historically worked, seams beneath the property, as summarised in Table 2.

Table 2: Summary of Past Underground Coal Mining

Colliery	Seam	Depth (m)	Direction to Workings	Dip of Worked Seam (Degrees)	Dip Direction of Worked Seam	Extraction thickness (m)	Year last mined
Unnamed	Ten Feet	71	Beneath Property	17.9	South-West	1.90	1966
Unnamed	Bowling Alley	100	Beneath Property	19.0	South-West	1.40	1873
Unnamed	Hard Mine	148	Beneath Property	23.5	West	1.88	1910
Unnamed	Cochshead	326	Beneath Property	15.5	West	2.54	1962

- 3.16 The report states that there are probable unrecorded shallow workings beneath the site.
- 3.17 There are no spine roadways at a shallow depth.
- 3.18 There are 5no of mine entries within 100m of the site, which are summarised below in Table 3 and shown in Figure 5 below.

Table 3: Summary of Mine Entries

Entry Type	Location	Name	Reference	Departure (m)	Grid Reference	Treatment Description
Shaft	Offsite	Victoria Salisbury Pumping Shaft	387355-005	0.00	387957 355311	It was filled, capped, and the top 60 metres grouted by the National Coal Board in 1983/84.
Shaft	Offsite	Victoria No. 6	387355-008	5.00	387860 355341	Capped by the National Coal Board in February 1984. Area of ground 22 feet x 6 feet excavated to expose the shaft, which was found to have been previously filled. Shaft capped 6 feet below ground level. Two 14-foot RSJs set across the shaft wall, with 30 cu m of concrete added, reinforced with steel mesh, and backfilled over the cap. Re-capped at 185.80m AOD following open-casting of site 1988-94 – upper portion of shaft and previous cap having been removed. Brown Lees OC, Ab plan 16656 refers.

Entry Type	Location	Name	Reference	Departure (m)	Grid Reference	Treatment Description
Shaft	Offsite	Victoria New Pit	387355-009	5.00	387814 355323	Capped by the National Coal Board in February 1984. Area of ground 32 feet x 12 feet excavated to expose the shaft, which was found to have been previously filled. The shaft was capped 10 feet below ground level, consisting of two 14-foot RSJs set across the shaft walls, together with 30 cum of concrete reinforced with steel mesh. Backfilled over the cap. Re-capped at 168.50m AOD following open-casting of site 1988-94 – upper portion of shaft and previous cap having been removed. Brown Lees OC, Ab plan 16656 refers.
Shaft	Offsite	-	387355-024	8.00	387875 355306	Recorded as dug out during past open-cast mining operations – Brown Lees OCC, Ab. plan 16656 refers. Was dug out during past open-cast mining operations – Brown Lees OCC, Ab. plan 16656 refers.
Adit	Offsite	-	387355-027	0.00	387801 355228	was dug out during the past opencast mining operations. Was dug out during the past opencast mining operations – Brown Lees OCC, Ab. plan 16656 refers.

3.19 The two closest mine shafts, 387355-008 and 387355-024, both within a former opencast quarry, have been treated and removed.

3.20 The report states that there is 1no. outcrop recorded on the site, as summarised in Table 4.

Table 4: Summary of Coal Outcrops

Seam Name	Seam Workable	Distance to Outcrop (m)	Direction to Outcrop	Bearing of Outcrop
Bellringer	Yes	Within	N/A	340

3.21 There are no geological faults, fissures, or break lines recorded on the site.

3.22 There are 2no. records of licensed and unlicensed opencast coal mining within 500m of the overall site, as shown in Figure 6.

3.23 There are no records of Coal Authority-managed tips within 500m of the site.

3.24 The overall site is not located within 50m of an area of a previous site investigation.

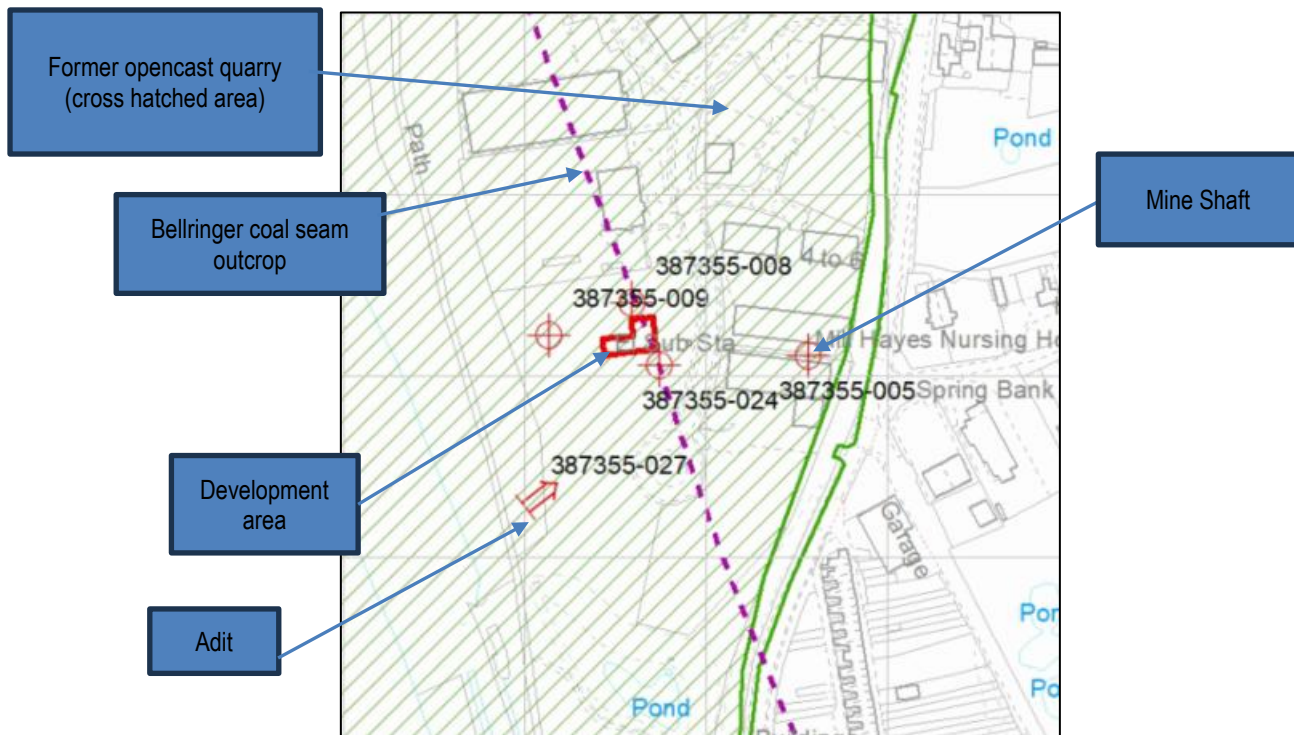
3.25 There are no records of any remediated sites within 50m of the overall site.

3.26 There are no records of claims regarding coal mining subsidence within 50m of the overall site boundary.

3.27 No records of mine gas have been recorded within 500m of the site boundary.

3.28 There are no records of mine gas or mine water treatment schemes within 500m of the site.

Figure 5: Coal Authority Map Extract



Historical Information

- 3.29 The 1840 historical map indicates that the site was developed as part of the Biddulph Valley Coal and Iron Works, with the site location on an area of raised ground. There is a trackway to the immediate north of the site and a main railway line to the west of the site. Brown Lees Colliery is located to the west of the site.
- 3.30 The 1888-1915 historical map indicates that the site is between two trackways of the Biddulph Valley Coal and Iron Works.
- 3.31 The 1937-1961 historical maps show an overhead trackway located at the location of the site.
- 3.32 The last publicly available map in 1975 indicates that the Biddulph Valley Coal and Iron Works is still present on the site.
- 3.33 Google Earth Imagery from 2000 indicates that the site has been cleared of all buildings, with new buildings constructed in 2006, including the existing wider site buildings to the north.
- 3.34 The Google Earth Image from 2024 indicates that the site is currently used as a truck storage 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 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 1870s and that this requirement was not rigorously enforced for some time after. Many shallow coal seams were worked before the introduction of the first edition Ordnance Survey Maps, and information on these workings is often not available. Therefore, if coal seams were accessible, 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 the 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 is causing loss of ground beneath the building and external areas.
 - Spontaneous combustion of old mine workings.

Coal Mining Assessment Criteria

- 4.7 Shallow workings-related ground subsidence events may manifest as localised crown hole collapses at the surface (which are related to workings roof failures), or can be associated with more extensive ground movements, typically associated with pillar collapse, floor heave, or a combination of roof and pillar failure.

- 4.8 As there is limited evidence for structural damage caused by pillar failure compared with that resulting from roof collapses, the focus of engineering assessments of the potential for instability at the ground surface has focused on roof collapses as the more likely mechanism of failure.
- 4.9 The limit height on void migration for roof collapses, where no appreciable surface subsidence can result, is termed 'acceptable cover'. The calculation of the amount of acceptable cover is determined by the worked thickness of the seam (t) and the amount of overlying rock cover (h) (and potentially overconsolidated Glacial Till cover – see below).
- 4.10 The acceptable cover criterion is generally referred to as ht.
- 4.11 The worked thickness of a coal seam (t) is often taken as being whichever is the greater of the following: 1.50m (the typical height of a mining roadway), or the coal seam thickness.
- 4.12 It is noted that a thickness greater than that of the coal seam may have been extracted during mining, for example, to remove a weak underlying seat earth horizon (for use as fireclay and/or to aid access through the mine).
- 4.13 According to CIRIA C758D, from the examination of mines within CMS, the height of collapse migration might exceptionally extend to 10 times the height of the original extraction.
- 4.14 As a result of this, the 10t criterion has been adopted by the industry as providing reasonable assurance against surface subsidence from roof collapses in old pillar and stall mines.
- 4.15 However, there are documented cases (albeit rare) where migrations in excess of 20t have been observed.
- 4.16 CIRIA C758D lists several circumstances where the acceptable cover criterion may need to be increased from 10t. These include:

Where the strata dip is >20 degrees

Where there are strong groundwater flows within workings and/or where there are rising or falling groundwater levels.

Where multi-seam extractions have taken place

Conclusions

- 4.17 The Coal Authority consider the site area to lie within a Coal Authority Development High Risk Area, due to historical shallow coal mine workings, and the site is in an area of former opencast mining.
- 4.18 The area of opencast mining was targeting the Ten-foot Coal Seam, Bellringer Coal Seam and Hams Coal Seams.
- 4.19 The Consultants Coal Authority report indicates that the past underground mining beneath the property was at a depth of 71m or greater. Therefore, there is sufficient rock cover to mitigate the collapse of any deeper coal seam, and the risk from past deep underground mining is very low.

- 4.20 Due to the former opencast mining at the site, the risk from shallow underground mining, principally of the Bellringer coal seam, is low, as it is highly likely that all of the shallow coal was extracted during the open-cast mining operations.
- 4.21 However, as the composition and quality of the backfill in the opencast mining area are unknown, a ground instability risk from the backfill, such as differential settlement, cannot be discounted.
- 4.22 Nearby coal mine shafts have been treated or removed by opencast quarrying.
- 4.23 Therefore, the overall site is at **LOW RISK** from historical coal mining.

Proposed Mitigation Strategy

- 4.24 Due to the presence of former open-cast coal mining, with the shallow coal seams likely removed as part of this process, the risk from historical shallow coal mining is low. Therefore, no further investigation regarding coal mining is required.
- 4.25 However, as the composition and quality of the backfill in the opencast mining area are unknown, a ground instability risk from the backfill (made ground), such as differential settlement, cannot be discounted.
- 4.26 A geotechnical investigation is therefore considered necessary to assess the bearing capacity of shallow soils.
- 4.27 This report should allow for planning permission to be granted.

APPENDIX 1

COAL AUTHORITY CONSULTANTS MINING REPORT

APPENDIX 2

REPORT LIMITATIONS

REPORT LIMITATIONS

This contract was completed by Earth Environmental & Geotechnical Ltd in accordance with a defined programme, scope of works, and terms and conditions agreed with the client. This report was compiled with all reasonable skill and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, and staff resources allocated to the project.

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The report was written in **2026** and should be read in light of any subsequent changes in legislation, statutory requirements, and industry best practices. Ground conditions can also change over time, and further investigations or assessments should be made if there is any significant delay in acting on the findings of this report. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of Earth Environmental & Geotechnical Ltd. In the absence of such written advice from Earth Environmental & Geotechnical Ltd, reliance on the report in the future shall be at the client's own and sole risk. Should Earth Environmental & Geotechnical Ltd be requested to review the report in the future, Earth Environmental & Geotechnical Ltd shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between Earth Environmental & Geotechnical Ltd and the client.

The observations and conclusions described in this report are based solely upon the services that were provided pursuant to the agreement between the client and Earth Environmental & Geotechnical Ltd. Earth Environmental & Geotechnical Ltd has not performed any observations, investigations, studies or testing not specifically set out or mentioned within this report.

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The services are based upon Earth Environmental & Geotechnical Ltd's observations of existing physical conditions at the site, gained from a walkover survey of the site, together with Earth Environmental & Geotechnical Ltd's 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 of that information, which 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 investigation excavations can only examine the ground at discrete locations. The potential exists to encounter ground conditions that differ from those considered in this report. The extent of the limited area depends on soil and groundwater conditions, 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; this should not be inferred to mean that other chemical species are absent.

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 and changes in local drainage conditions, and higher levels may occur at other times of the year than those recorded during this investigation.

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