



Coal Mining Risk Assessment
Edenfield Road, Rochdale

Reference: 16-702-R1-1
Date: April 2023



COAL MINING RISK ASSESSMENT

Edenfield Road
Rochdale
OL12 7TN

Prepared for:

Jackson, Jackson & Sons Limited

Report Ref: 16-702-R1-1

Date Issued: April 2023

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EXECUTIVE SUMMARY

Site Address	Edenfield Road, Rochdale OL12 7TN	
Grid Reference	E 359443, N 406177	
Site Area	0.046 Ha	
Current Site Use	The site is a vacant, rectangular parcel of land with overgrown vegetation across the site. The southern boundary of the site is formed of mature trees and hedgerows. Boundaries are demarcated by dry stone walls. A partially constructed structure is present in the eastern sector of the site, comprising foundations and the lower brick course. Vegetation has grown through the internal part of the structure, indicating construction was abandoned some time ago.	
Proposed Development	Jackson, Jackson & Sons Limited are assisting their client in the proposed construction of a low-rise residential dwelling with associated garden and utility infrastructure in the centre of the current vacant plot of land.	
Geological Setting	Drift Geology	Glacial Till
	Bedrock Geology	Pennine Lower Coal Measures Formation (majority of site) Rough Rock (north east corner)
	Faults	A north west – south east trending fault bisects the north east corner of the site.
Coal Mining/Land Stability	Geological mapping for the site shows a northwest-southeast trending fault bisecting the north-eastern corner of the site. The local geology is indicated to generally dip 5-10° to the south east. A coal seam (possibly the Bassey or Lower Foot seam) is indicated to crop the west of the site encroaching into the northwest corner of the site and terminating at the fault. Unrecorded workings beneath the site are considered probable and a mine entry is recorded on the western site boundary (385414-017). On the basis that the seam beneath the site is the Lower Foot, with a workable thickness of 0.30 m, 3.00 m of competent rock cover would be required above the seam to mitigate risks of migrating voids propagating to the surface and resulting in subsidence (based on 10 x seam thickness). Investigation would be required to determine the depth to rockhead and presence of any coal seams and/or workings beneath the site. In respect of the mine shaft identified on the western boundary, the assumed shaft diameter is 2.50 m and the departure zone (margin of error for the position of the shaft) is 10.00 m. Based on this information and the inferred depth to rockhead of 5.00-9.00 m, the potential zone of influence (radial stand-off / no build zone) around the shaft may be up to 20.25 m if the position remains unconfirmed (reduced to 10.25 m if located, treated and capped), as shown in Figure 5.1. Note: actual distances would be confirmed on confirmation of the depth to rockhead. There is concluded to be a high risk from mining related subsidence (associated with underground workings and the adjacent disused mine shaft) and a moderate to high risk from mine/ground gas.	



RECOMMENDATIONS

Due to the presence of shallow coal workings below the site, E3P recommends the following works are undertaken to ensure that all areas of potential shallow mine workings are identified and assessed:

-  Trial Trenching should be undertaken to investigate the potential presence of the mine shaft (385414-017) within the 10 m departure distance of its current recorded position. If the shaft is identified within the site boundary, treatment works would be required to stabilise the feature and a shaft cap or plug would be required at rockhead.
-  A series of rotary open holes should be advanced to a nominal depth of 30 m across the site to confirm the depth to rockhead and investigate the potential presence of the Bassy/Lower Foot Coal seam and any associated shallow workings.
-  Ground gas monitoring well should be installed within selected rotary boreholes to assess the risk from mine/ground gas.
-  Following the confirmation of the position of the mine shaft and the depth to rockhead a Zone of Influence/no build zone for 385414-017 should be calculated and if the proposed structure falls within this area, specialist foundation designs will require submission to the Coal Authority for an engineering appraisal.



TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
1. INTRODUCTION	5
1.1. Background	5
1.2. Proposed Development.....	5
1.3. Objectives	6
1.4. Limitations	6
1.5. Sources of Information	6
1.6. Confidentiality.....	6
2. SITE SETTING	7
2.1. Site Details	7
2.2. Current Site Use	7
2.3. Surrounding Area	8
2.4. Geological Setting	8
3. SITE HISTORY.....	9
3.1. On-Site Historical Development.....	9
3.2. Off-Site Historical Development	11
3.3. Planning History	11
3.4. Anecdotal Information	12
4. E3P COAL MINING RISK ASSESSMENT	14
4.1. Summary of Coal Mining Information	14
4.2. Preliminary Mine Gas Assessment	21
4.3. Coal Mining Risk Assessment	22
5. CONCLUSION & RECOMMENDATIONS.....	23
APPENDIX I LIMITATIONS.....	25
APPENDIX II GLOSSARY	27
APPENDIX III COAL AUTHORITY MINING REPORT	30
APPENDIX IV DRAWINGS	31

DRAWING LIST

16-702-001 - Site Location Plan
16-702-004 - Site Features Plan
16-702-003 - Historical Features Plan
16-702-011 - Coal Mining Issues Plan



1. INTRODUCTION

1.1. BACKGROUND

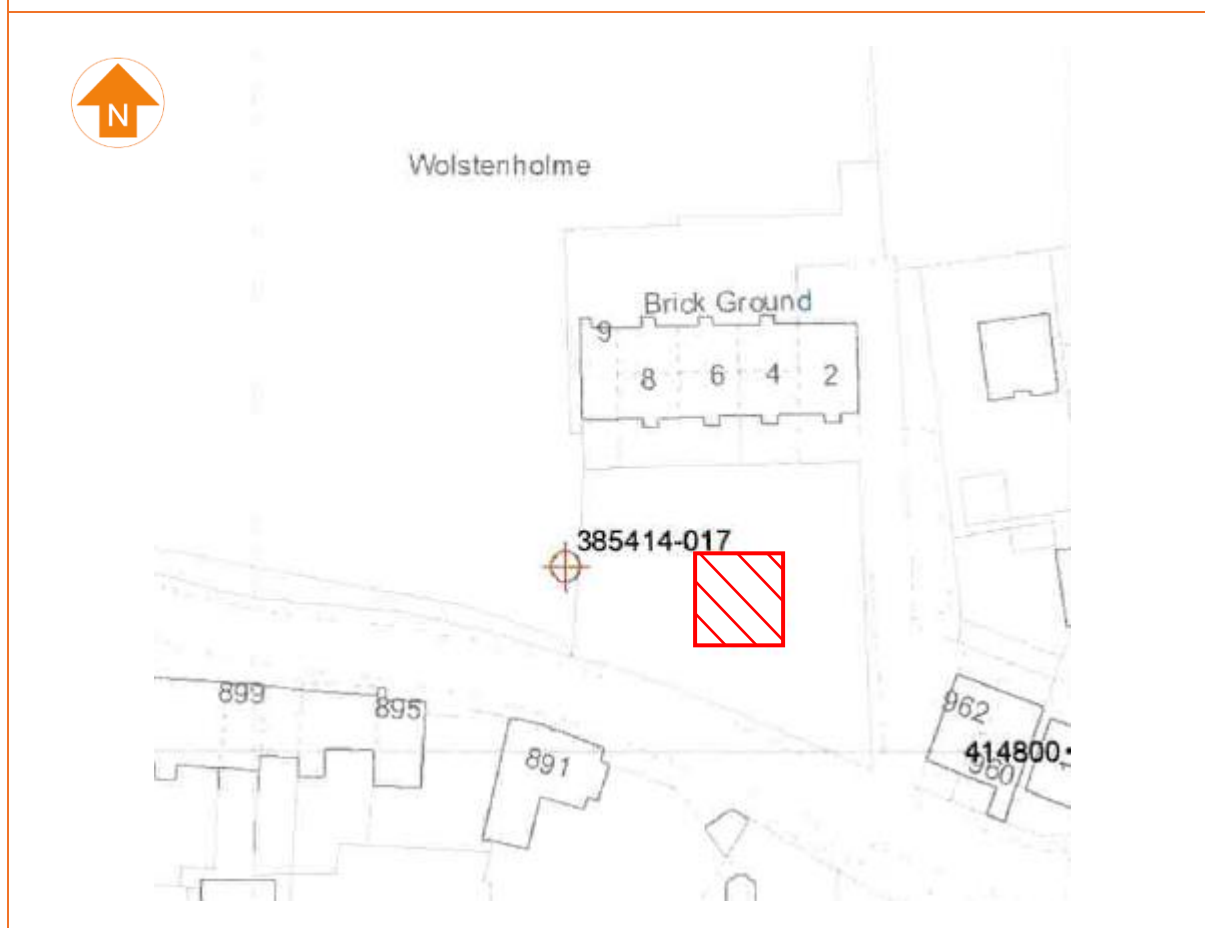
E3P Ltd has been commissioned by Jackson, Jackson & Sons Limited on behalf of their client to undertake a desk-based Coal Mining Risk Assessment for a parcel of land to the north of Edenfield Road, Rochdale.

This report is required to determine potential geotechnical issues posed to the development by shallow underground coal mining beneath the subject site. The report will review suitable information, previous reports and anecdotal data in order to provide a detailed Coal Mining Risk Assessment, which will identify mining related geotechnical liabilities associated with a proposed future residential development.

1.2. PROPOSED DEVELOPMENT

E3P understands that Jackson, Jackson & Sons Limited are assisting their client in the proposed construction of a low-rise residential dwelling with an associated garden and infrastructure in the centre of the current vacant plot of land. Figure 1.1 shows the likely location of the proposed dwelling, provided by the client.

FIGURE 1.1 SNAPSHOT OF PROPOSED DEVELOPMENT



1.3. OBJECTIVES

The objectives of the geoenvironmental investigation are as follows:

- ✳ Review historical plans, geology, hydrogeology, mine abandonment plans, mining records and any local authority information available in order to complete a coal mining risk assessment;
- ✳ Assess the implications of any potential mining risks, liabilities and development constraints;
- ✳ Provide recommendations regarding future works required and undertake a preliminary pre-construction cost appraisal;
- ✳ Specify further investigation were/if required.

1.4. LIMITATIONS

The limitations of this report are presented in Appendix I.

1.5. SOURCES OF INFORMATION

Background information was sought from the following sources:

- ✳ Historical mapping dated 1885 to 1972.
- ✳ Google Earth.
- ✳ Online planning records held by Rochdale Borough Council.
- ✳ Coal Authority Consultants Report (Report Ref: MR- 51003343608001 - 1678709685582);
- ✳ British Geological Survey Map.

1.6. CONFIDENTIALITY

E3P has prepared this report solely for the use of the client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from E3P; a charge may be levied against such approval.



2. SITE SETTING

2.1. SITE DETAILS

TABLE 2.1 SITE DETAILS

Site Address	Edenfield Road, Rochdale, n
National Grid Reference	E385156 N414824
Site Area	0.12 Ha

All acronyms used within this report are defined in the Glossary presented in Appendix II.

A site location plan is presented in Appendix III as Drawing 16-702-001.

2.2. CURRENT SITE USE

E3P has undertaken a review of available aerial imagery and online viewing platforms to provide a brief description of the site.

TABLE 2.2 SITE DESCRIPTION

Occupancy/Use	The site is located to the north of Edenfield Road, Norden, Rochdale and comprises a vacant, overgrown rectangular parcel of land. The southern boundary of the site is formed of mature trees and hedgerows. Boundaries are demarcated by dry stone walls.		
Structures	A partially constructed structure is present in the eastern sector of the site, comprising foundations and the lower brick course. Vegetation has grown through the internal part of the structure, indicating construction was abandoned some time ago.		
Access	Access to the site is gained via an access track (Brickground) that runs along the eastern boundary of the site.		
Slope	The land falls towards the east.		
Retaining Structures	Unknown.		
Surface Cover (%)	Buildings:	1 % (brick framework only)	
	Hardstand:	0 % (slab not thought to be present)	
	Soft cover:	99 %	
Vegetation/Ecology	The site is overgrown with grasses and wind-blown self-seeded vegetation. Semi-mature/mature hedgerows and trees are present along the southern and western boundary.		
Hazardous Material Storage	No above-ground storage tanks (AST) or underground storage tanks (UST) are anticipated to be present.		
Asbestos-Containing Material (ACM)	Due to the lack of recorded historical development, it is unlikely that ACM will be present on-site.		
Polychlorinated Biphenyls (PCBs)	There is no equipment identified that may contain PCBs within the site boundary.		
Waste Storage	Potentially hazardous waste streams are unlikely to be generated at the site.		



Utilities	Statutory plans have not been obtained for the site, however, street lighting is present along the southern boundary (Edenfield Road), together with pole mounted overhead BT cables.
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2.3. SURROUNDING AREA

The surrounding area land uses are summarised in Table 2.3.

TABLE 2.3 SURROUNDING LAND USES

DIRECTION	LAND USE
North	Residential Properties
East	Residential Properties
South	Residential Properties
West	Open farmland

2.4. GEOLOGICAL SETTING

The British Geological Survey (BGS) map (Sheet 76) for the site, (1:50,000, Solid and Drift editions) and online records indicate the site is underlain by the geological sequence presented in Table 2.4.

TABLE 2.4 SUMMARY OF UNDERLYING GEOLOGY

GEOLOGICAL UNIT	CLASSIFICATION	DESCRIPTION
Drift	Glacial Till	SAND, CLAY and GRAVEL
Solid	Pennine Lower Coal Measures Formation Rough Rock (north east)	MUDSTONE, SILTSTONE, SANDSTONE SANDSTONE

There are no BGS borehole records in the immediate vicinity of the site, however, Table 2.5 provides a summary of the nearest boreholes to the north and west of the site for an overview of depth to bedrock in the wider area.

TABLE 2.5 NEARBY BGS BOREHOLE RECORDS

BOREHOLE REFERENCE	MADE GROUND	SUPERFICIAL	SOLID
SD81SE49 510 m North	N/A	Blue CLAY and Boulder CLAY 0.00 – 8.53 m bgl	SANDSTONE (ROUGH ROCK) over SHALE 8.53 – 122.78 m bgl (No coal recorded)
SD81NW4 995 m West	0.00 – 1.83 m bgl	Boulder CLAY 1.83 – 5.49 m bgl	SANDSTONE and SILTSTONE 5.49 – 260.00 bgl Marine band and thin coal at c. 48 m, Sandrock Coal at c. 56 m bgl

Based on this information, the depth to rockhead may be between 5.00-9.00 m bgl beneath the site.



3. SITE HISTORY

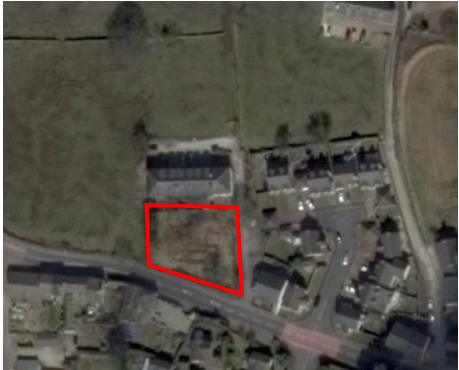
3.1. ON-SITE HISTORICAL DEVELOPMENT

A review of publicly available historical mapping pertinent to the site is summarised in Table 3.1 below.

TABLE 3.1 SITE HISTORICAL DEVELOPMENT

MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
1885-1900 One Inch	Two structures are present on the site. The use and the nature of the structures is known.	
1888-1913 Six Inch	The previously identified structures have been removed. The site is now in the same layout as it is found to this day. <i>Note: An old shaft is recorded c. 90 m north of the site.</i>	
1945 1:25,000	No further changes recorded.	
1949-1972 1:10,000	Contour lines that are present on the base map, which indicate that the land slopes to the east. No further changes onsite.	



MAP EDITION	HISTORICAL LAND USE	HISTORICAL MAP EXCERPT
Google Earth 2000	Aerial photography suggests that the site is formed of managed pasture with mature trees present on the eastern, southern and western boundaries.	
Google Earth 2013	Construction of a structure has commenced in the eastern sector of the site.	
Google Earth 2016	No further works to the proposed structure has taken place and it appears that the site has been left abandoned with dense vegetation now present across the site.	
Google Earth 2022	No further changes recorded.	



3.2. OFF-SITE HISTORICAL DEVELOPMENT

A review of potentially contaminative uses identified on historical Ordnance Survey maps within a 250 m radius of the site is summarised in Table 3.2.

TABLE 3.2 SURROUNDING POTENTIALLY CONTAMINATIVE LAND USES

SURROUNDING FEATURE	DISTANCE	DATES	DIRECTION
Baitings Mill Then: Removed and redeveloped into housing	10 m	Pre 1888–Pre 2003 Pre 2003–Present	East
Old Shaft Then: no longer marked	90 m	Pre 1888–Pre 1945 Pre 1945–Present	North
Reservoir	140 m	Pre 1888–Present	North
Old Quarry Then: Infilled	220 m	Pre 1888–Pre 1949 Pre 1949–Present	North
Reservoir Then: Infilled	240 m	Pre 1888–Pre 1949 Pre 1949–Present	Northwest
Old Quarry	250 m	Pre 1888–Present	Northwest
Lane Side Mill Then: no longer marked	250 m	Pre 1888–Pre 1892 Pre 1892–Present	South

3.3. PLANNING HISTORY

E3P has undertaken a detailed search of on-line planning records held by Rochdale Borough Council which has identified several planning applications for the site in question, as summarised in Table 3.3.

TABLE 3.3 PREVIOUS ON-SITE PLANNING APPLICATIONS

PLANNING APPLICATION	DETAILS	DATE	OUTCOME
92/D27872	Erection Of One Dwelling	Feb 1992	Grant subject to conditions
95/D31935	Renewal Of Outline Planning Application (D27872) For One Dwelling	Apr 1995	Grant subject to conditions
98/D35417	Renewal Of Outline Planning Permission D31935 For The Erection Of One Dwelling.	May 1998	Grant subject to conditions
01/D38689	Renewal Of Outline Planning Permission D35417 For The Erection Of One Dwelling.	May 2001	Grant subject to conditions



PLANNING APPLICATION	DETAILS	DATE	OUTCOME
05/D45369	Erection Of 2 Detached Dwellings.	Jun 2005	Refuse
05/D46037	Erection Of One Dwelling	Nov 2005	Grant subject to conditions
22/00575/CPE	Application for a certificate of lawfulness (Existing) relating to the lawful commencement of development under planning permissions D38689 and D46037	Jul 2022	Grant

A review of each application has found no previously submitted documents available for review. The latest decision notice for planning application ref: 22/00575/CPE does not include any conditions in respect of contaminated land or coal mining.

3.4. ANECDOTAL INFORMATION

A web-based search of the subject site has recovered the following information on collieries within 250 m of the site boundary, these are summarised in Table 3.4. The information provided is not accredited, however, it has been gathered from a database in which collieries/mine entry points are recorded: Mindat.org.

TABLE 3.4 SUMMARY OF COLLIERIES/SHAFTS

DISTANCE FROM SITE	DETAILS/NAME	OPENING DATE	CLOSING DATE	EASTING	NORTHING
On Site	Lane Side Coal Pit	N/A	N/A	385163	414792
20 m S	Four Lane Ends Colliery	N/A	N/A	385144	414792
40 m W	Baitings Colliery	1855	1865	385126	414823



FIGURE 1.1 SNAPSHOT OF COLLIERIES/SHAFTS FROM MINDAT.ORG



4. E3P COAL MINING RISK ASSESSMENT

A CA mining report was obtained (Ref: 51003343608001) dated 13th March 2023.

The CA operates a risk-based approach to the assessment of potential instability issues associated with future development of land located within the predefined CA consultation areas. This risk-based approach subdivides the potential risk into “low” and “high” risk categories.

The risk categories can be defined as:

Low-Risk Sites – Deemed to be land where coal mining has taken place, however it was at such depth not to pose a risk to new development and it therefore contains no known recorded risks and as such no further assessment is required.

For low-risk sites, the CA categorically states:

If your proposed development is within the Development Low Risk Area there is no need for you to submit any coal mining information with your planning application and The Coal Authority will not be consulted by the LPA. The LPA will include our Standing Advice as an informative note within the decision notice.

High-Risk Sites – Deemed to be landholdings located within an area known to contain legacy risks that include:

- ✳ Mine entries (shaft or adit);
- ✳ Shallow coal workings (recorded and probable);
- ✳ Workable coal seam outcrops;
- ✳ Mine gas sites and areas;
- ✳ Recorded coal-mining-related hazards;
- ✳ Geological features (fissures and break lines); and
- ✳ Former surface mining sites (sometimes using historic opencast extraction methods).

4.1. SUMMARY OF COAL MINING INFORMATION

Prior to the enactment of the Coal Mines Regulation Act (1872), which came into force on the 1st January 1883, there was no statutory requirement to record the extent of abandoned mine workings and as such the CA has no knowledge of extensive workings throughout the UK Coal Fields where shallow workings are present at a depth that could result in a subsidence event in the future (through successive cavitation) associated with failure of support mechanism.

To determine if a site may have unrecorded or recorded coal mine workings requires the consideration of a wide range of information and E3P has completed a review of relevant information in relation to potential coal mining activities.

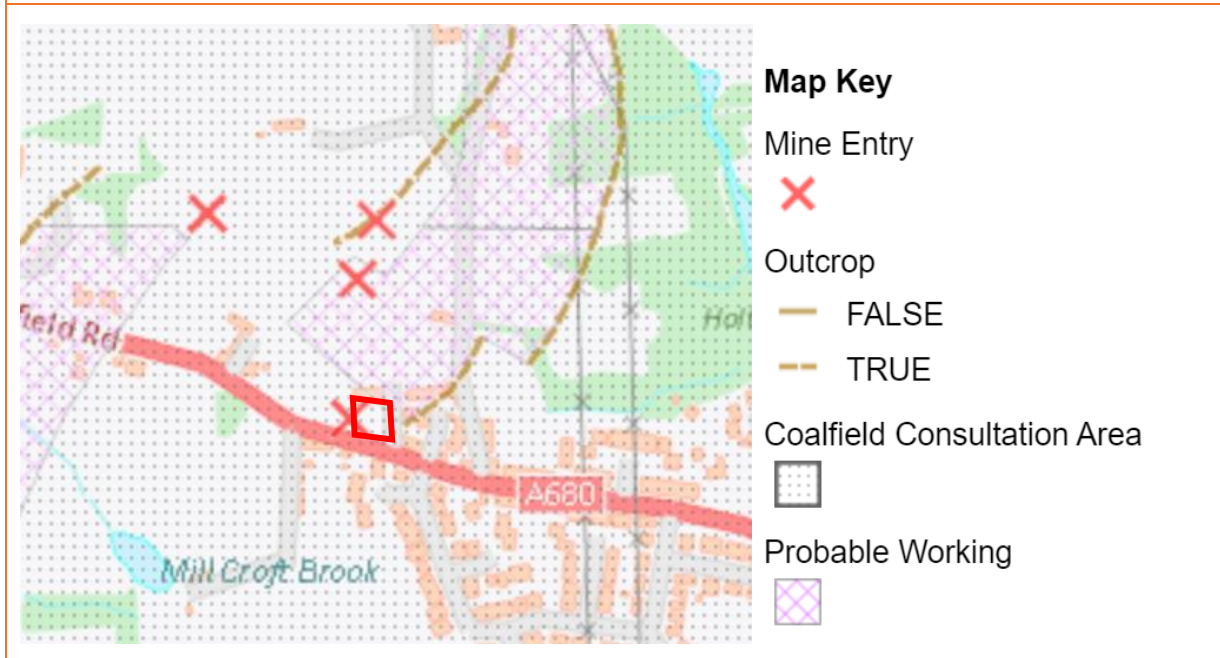
In the first instance, E3P has reviewed the Coal Authority Online Viewer and an excerpt is presented as Figure 4.1.



The site partially lies within a development high risk area in the northeast of the site, associated with underground workings and a coal seam. The coal seam appears to terminate close to the eastern boundary, likely associated with faulting.

Additionally, the western boundary of the site intersects a development high risk areas associated with a mine shaft present on the boundary of the site. The mine shaft that is indicated on the western boundary is referenced: ME 385414-017.

FIGURE 4.1 EXTRACT OF THE COAL AUTHORITY ONLINE VIEWER



As the site is within an area affected by Coal Mining E3P has consulted with the Coal Authority, who have provided a Consultant Coal Mining Report for the site (Ref: 51003343608001).

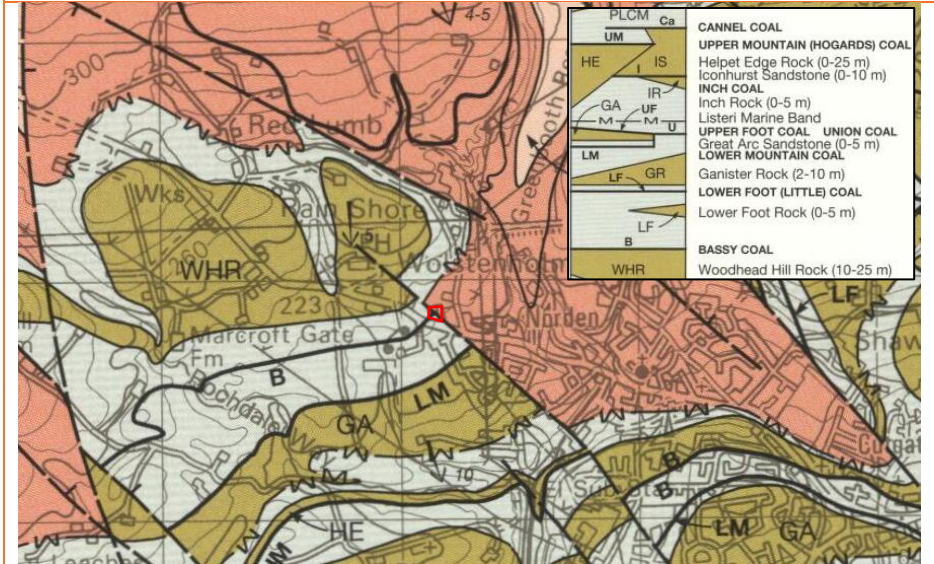
Table 4.1 provides a summary of pertinent coal mining information with this report.



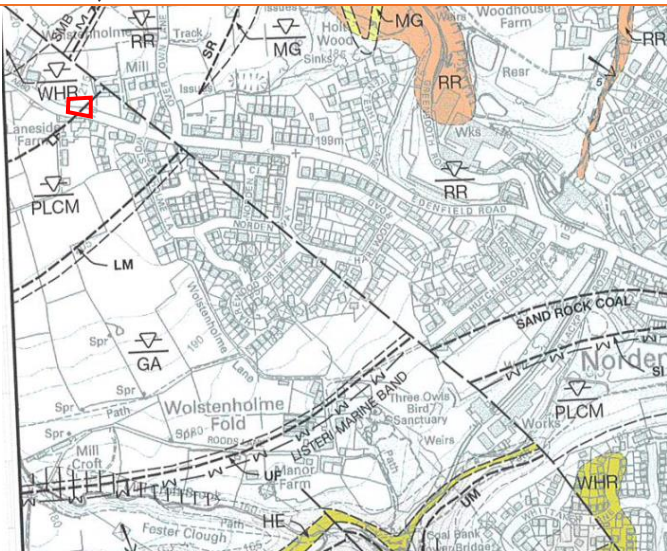
TABLE 4.1 COAL MINING INFORMATION

SOURCES OF INFORMATION	SUMMARY
Known Past Underground Mining	No past underground mining recorded.
Probable Unrecorded Workings	Yes.
Spine Roadways at Shallow Depth	No spine roadway recorded at shallow depth.
Mine Entries within 100m of the site	Yes. Shaft 385414-017 is located on the western boundary of the site (NGR E385138 N414822). There is no treatment information for the shaft. Note: A review of the Coal Authority Interactive Viewer suggests the assumed shaft diameter would be 2.5 m. The departure zone (margin of error for the position of the shaft) is 10 m.
Mine Abandonment Plans	Yes.
Known outcrops	Yes. Sand Rock Seam outcrops 13.6 m east of the site. Note: Based on nearby BGS borehole records, rockhead may be present at 5.00-9.00 m bgl. The seam would therefore be anticipated to be at a shallow depth beneath the site.
Faults / Fissures	NW/SE trending fault bisects the north-eastern corner of the site.
Opencast Mines	None recorded within 500 m of the site boundary.
Coal Authority Managed Tips	None recorded within 500 m of the site boundary.
Remediated Sites	None recorded within 50 m of the site boundary.
Coal Mining Subsidence	No damage notice, claim for subject property or property within 50m of the enquiry boundary has been submitted to the Coal Authority since October 1994.
Mine Gas	None recorded within 500 m of the site boundary.
Mine Water	None recorded within 500 m of the site boundary.
Future Underground Mining	None proposed.
Coal Authority Development Advice	If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

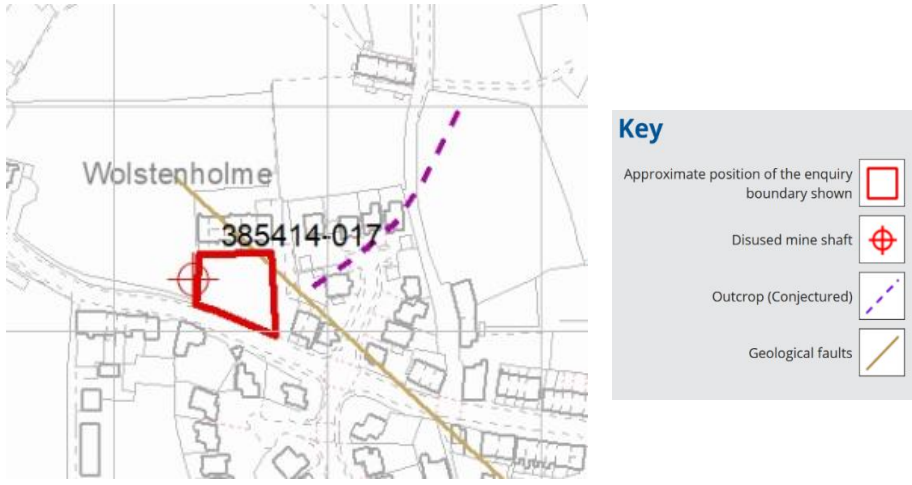


SOURCES OF INFORMATION	SUMMARY
1:50,000 British Geological Survey Mapping	The 1:50,000 map (Sheet 76, Solid, 2008 – extract in Figure 4.2, overleaf) shows the site to be located on a north west-south east trending fault line, located beneath the north east sector of the site. The local geology is shown to dip 5-10° to the south-south east from horizontal. The Bassy coal seam (B) is shown to crop to the west of the site, striking northeast-southwest and terminating at the aforementioned fault. It is possible that the seam extends within the site boundary, beneath the western sector of the site, and based on the local geology, would be anticipated to dip beneath the remainder of the site. The Lower Mountain coal seam (LM) is also shown to crop to the south of the site, dipping away from the site. Based on the geological section (inset with Figure 4.2) the Lower Foot coal seam would be anticipated to crop somewhere approximately mid-way between the Bassy and the Lower Mountain. This would place the crop off-site, to the southeast, and dipping away from the site. FIGURE 4.2 1:50,000 GEOLOGICAL MAP EXTRACT 
1:10,000 British Geological Survey Mapping	The 1:10,000 geological map for the area (SD81SE – Figure 4.3) concurs with the 1:50,000 map, again showing a fault trending northwest-southeast bisecting the north-eastern corner of the site. The downthrow is noted to be to the south. The local geology is indicated to generally dip to the south east. The strata south of the fault (representative of the site) is shown to be dipping in a south-easterly direction at 10° from horizontal. North of the fault, the strata dips 5° from horizontal. However, where the Bassy seam was indicated to crop the west on the 1:50,000 map, the 1:10,000 map indicates instead that the Lower Foot coal outcrops to the north west, potentially crossing through the northwest corner of the site. Given the indicated dip of the local geology, the Lower Foot Coal would therefore be anticipated beneath the remainder of the site.

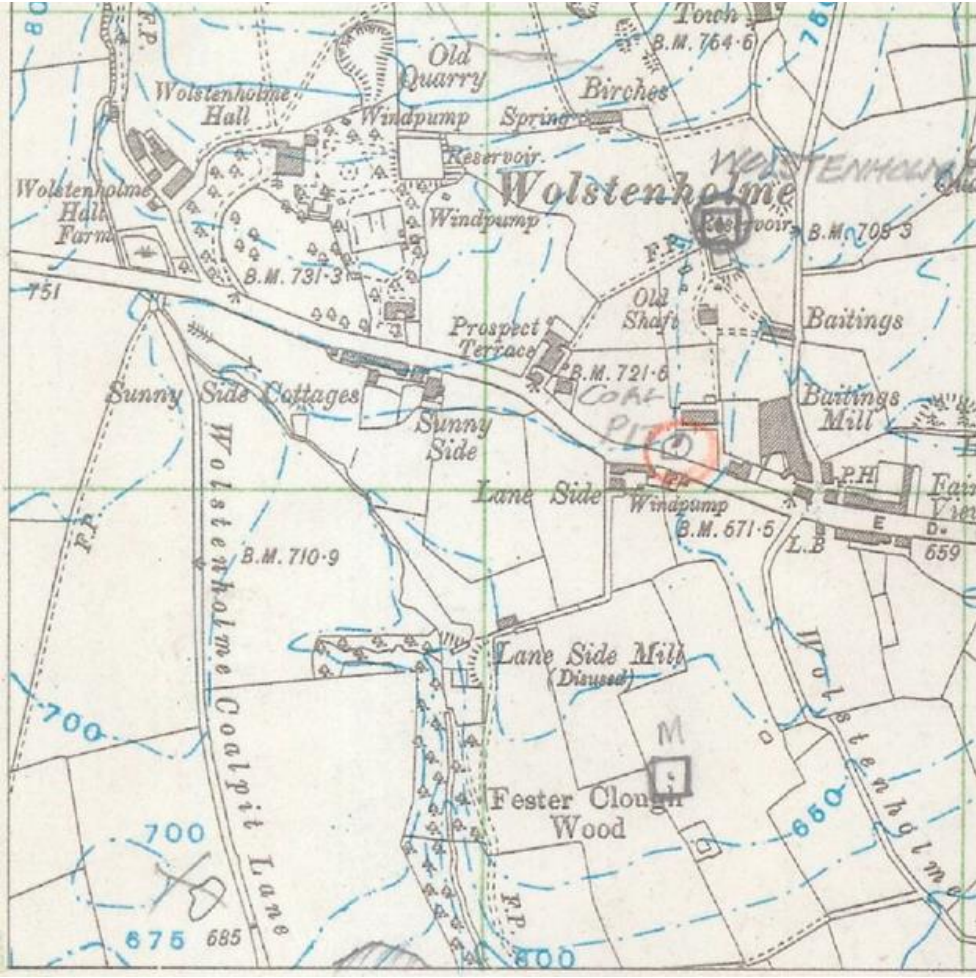


SOURCES OF INFORMATION	SUMMARY
	FIGURE 4.3 1:10,000 GEOLOGICAL MAP EXTRACT  The Bassy seam, being older in the geological sequence, may therefore also be present beneath the site at greater depth. It is noted that no mine shafts are evident within close proximity of the site.
Coal Authority Plan	The Coal Authority plan: MR-LARGE-PLOT-51003343608001-1678709681501 (Figure 4.4 and presented in Appendix IV) records the position of the previously noted fault to intersect the north-eastern corner of the site. The plan also shows a conjectured coal crop approximately 14 m to the east of the site, (north of the fault) and terminating at the fault. A disused mine entry is also shown on the western site boundary (385414-017). Based on the Coal Authority Consultants Mining Report, the conjectured coal seam has been inferred by the Coal Authority to be the Sand Rock seam. With reference to the 1:10,000 scale geological map (Figure 4.3), the Sand Rock crop is shown in a position further south east of the site, and not meeting with the fault. It is therefore unknown how the Coal Authority has determined the position of this particular seam, but based on the local dip of 5-10° to the south-south east, this seam would not dip beneath the site. The Bassy, Lower Foot and Lower Mountain seams, previously shown south of the fault on geological mapping, and dipping south-southwest, are not recorded on the Coal Authority Plan. The absence of the seams south of the fault raises the question as to which seam the recorded mine shaft on the western boundary would be working, and thus what the likely depth of the mine entry would therefore be.



SOURCES OF INFORMATION	SUMMARY
	FIGURE 4.4 COAL AUTHORITY PLAN FOR THE SITE  It is also noted that this plan concurs with the Coal Authority Interactive Viewer data for the site, with a coal seam cropping north of the fault and east of the site. On review of the Interactive Viewer development high risk area for the conjectured Sand Rock seam (Figure 4.1), this appears to the north west of the seam, with no high risk area to the south east (as would be expected based on the direction of dip shown on geological mapping for the area). It may be inferred that the seam is not of workable thickness and therefore does not present a risk from mine workings, however, the Coal Authority mining report confirms the Sand Rock seam to be workable. The Coal Authority information is inconsistent with the recorded geology for the area. E3P consider the geological mapping to be more reliable in this instance, particularly as this would place a coal seam crop to the west of the site, dipping south-south east beneath the site, with a mine entry coinciding with / located just south of, the seam. In addition to the inconsistencies in respect of the geology, the Coal Authority does not appear to hold records for past workings beneath the subject site. This is contradictory when considering the position of the mine entry on the western boundary. A mine entry would be expected to have associated workings. Given the local dip of the geology, we would anticipate the associated workings would lie beneath the site. If the workings were off-site, this would suggest a different dip direction i.e. a localised anticline.
Review of BGS Memoirs	Reference has been made to BGS Memoir: The Geology Of Manchester And The South-East Lancashire Coalfield. 1931. The edition states that the Bassy Mine is known throughout the eastern area of the coal field as the Yard or Lower Yard and in all districts is represented by a shaly coal, and is rarely found to be a good workable coal. Thicknesses have been recorded up to 3 ft thick (0.91 m). The Lower Foot is generally recorded to comprise 1 ft (0.30 m) of good coal and mined locally in several small mines.



SOURCES OF INFORMATION	SUMMARY
	The Sand Rock is locally recorded to be 1-2 ft thick (0.20-0.60 m).
Abandonment Plans	The Coal Authority has confirmed that the only reference to the shaft is a handwritten annotation on the British Coal Lancashire 6 inch County Sheet, 1911 80 SE as presented in Figure 4.5. FIGURE 4.5 ANNOTATED BRITISH COAL LANCASHIRE 6 INCH COUNTY SHEET, 1911 80 SE 
Historical Ordnance Survey Mapping	A review of the 1:10,000 Ordnance Survey mapping from circa 1885 has identified an 'old shaft' noted 120 m to the north of the site. 1:50,000 geological mapping from 1971 also shows a colliery at this location. The colliery is absent from the subsequent 2008 geological map. It is considered that further historical mining features are likely to be present in close proximity to the site that have not been mapped or recorded. Contradictory
Historical Site Investigations	E3P has not been provided with any historic site investigation reports.



4.2. PRELIMINARY MINE GAS ASSESSMENT

If coal mining is present below the site, then this may be a potential source of ground gas that could pose a risk to site end users. A preliminary mine gas assessment is provided within Table 4.2.

TABLE 4.2 PRELIMINARY MINE GAS ASSESSMENT

SCENARIO	DISCUSSION	RATING
Are there known coal seams beneath the site?	Yes – based on geological mapping, the Bassy/Lower Mountain seam would be present at shallow depth beneath the site.	High
Are there coal seams within 150 m of the top of bedrock?	Yes – based on inferred depth of rockhead being between 5.00-9.00 m bgl and a coal crop on the western boundary dipping beneath the site at 5-10 degrees.	High
Are there any known workings below the site?	No – None recorded by the Coal Authority, but may be present associated with adjacent Mine Entry.	Moderate
Are the underlying drift deposits impermeable?	BGS boreholes in the area suggest that cohesive deposits are likely to be present beneath the site.	Low/Moderate
Are there any mine entrances within the site boundary or within 50 m of the site?	Yes – one mine shaft is present on the western boundary of the site.	High
Are there any faults below the site or in close proximity?	Yes – northwest-southeast trending fault bisects the north-eastern corner of the site.	High
Are there any records of mine gas emission on or within 50 m of the site	No.	Low
Are there any record of historical mine stabilisation works?	No.	Low
Evidence of rising groundwater in flooded mine workings?	Not known.	Low
OVERALL MINE GAS RISK (IF MODERATE/ HIGH THEN FURTHER ASSESSMENT IS REQUIRED)		Moderate/High



4.3. COAL MINING RISK ASSESSMENT

This risk assessment comprises a desk-based review of all available information on coal mining issues that are relevant to the application site deemed to be located within a moderate to high-risk area. This includes:

-  Interpretation of information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact of issues;
-  Setting 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; and
-  Demonstrating 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.

The coal mining risk assessment is summarised in Table 4.3.

TABLE 4.3 SUMMARY OF COAL MINING RISK ASSESSMENT

COAL MINING RISK ASSESSMENT	YES/NO	RISK ASSESSMENT
Recorded Underground Coal Mining at Shallow Depth (< 30 m)	Likely	High
Recorded Underground Coal Mining at Shallow Depth (> 30 m)	No	Low
Evidence of Unrecorded Surface Extraction of Coal Outcrop	No	Low
Unrecorded Underground Coal Mining at Shallow Depth (< 30 m)	Yes	High
Mine Entries (Shaft/Adits)	Yes	High
Coal Mining Geology – Fractures/Fissures	Yes	High
Recorded Gas Emissions	No	Low
Recorded Mining Surface Hazard	No	Low
Surface Mining (Opencast)	No	Low

Based on the above, there is considered to be a high risk from shallow unrecorded coal workings beneath the site and the presence of a mine entry on the western site boundary.



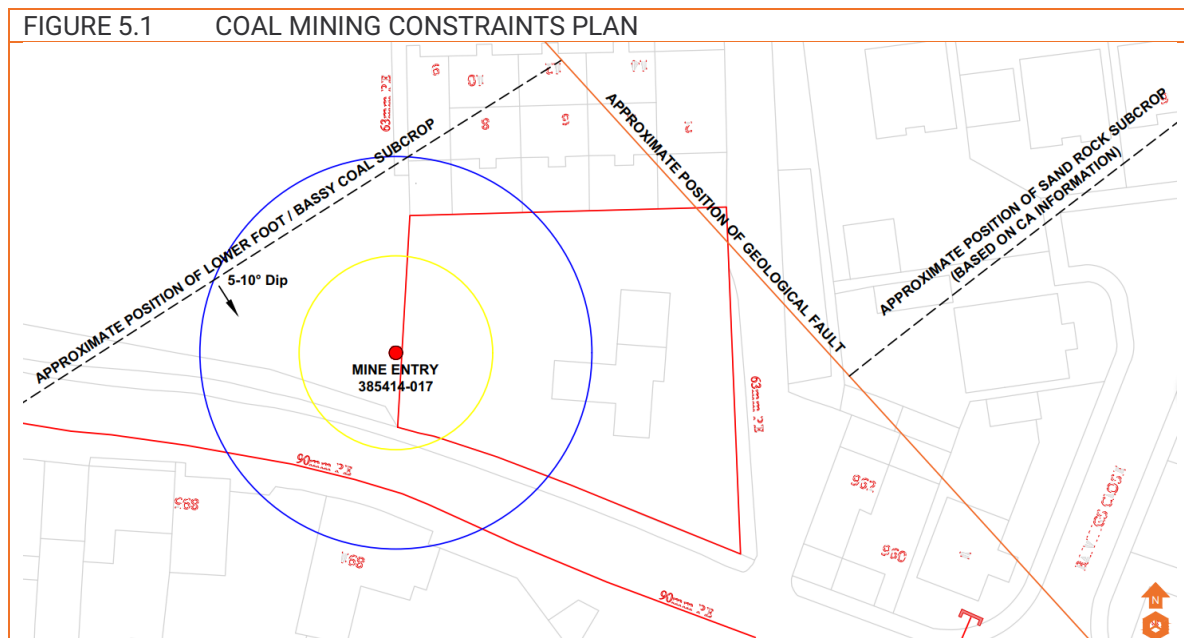
5. CONCLUSION & RECOMMENDATIONS

Geological mapping for the site shows a northwest-southeast trending fault bisecting the north-eastern corner of the site. The local geology is indicated to generally dip 5-10° to the south east. A coal seam (possibly the Bassey or Lower Foot seam) is indicated to crop the west of the site encroaching into the northwest corner of the site and terminating at the fault. Given the indicated dip of the local geology, the coal seam would therefore be anticipated at rockhead in the north west of the site (inferred c. 5.00-9.00 m bgl based on available BGS borehole records) dipping to 4.00-8.00 m below rockhead in the south west. Unrecorded workings beneath the site are considered probable and a mine entry is recorded on the western site boundary (385414-017).

Based on BGS memoirs, it is more likely that the seam would be the Lower Foot mine, as this is understood to be of workable quality in the area, albeit of limited thickness (0.30 m), whereas the Bassy is generally shaly and of poor quality.

On the basis that the seam beneath the site is the Lower Foot, with a workable thickness of 0.30 m, 3 m of competent rock cover would be required above the seam to mitigate risks of migrating voids propagating to the surface and resulting in subsidence (based on 10 x seam thickness). Investigation would be required to determine the depth to rockhead and presence of any coal seams and/or workings beneath the site.

In respect of the mine shaft identified on the western boundary, the assumed shaft diameter is 2.50 m and the departure zone (margin of error for the position of the shaft) is 10.00 m. Based on this information and the inferred depth to rockhead of 5.00-9.00 m, the potential zone of influence (radial stand-off / no build zone) around the shaft may be up to 20.25 m if the position remains unconfirmed (reduced to 10.25 m if located, treated and capped), as shown in Figure 5.1. Note: actual distances would be confirmed on confirmation of the depth to rockhead.



The no-build zone would be required to protect structures if a failure was to occur. The CA is a statutory body that works with the planning authority that seldom allows plots to be constructed within the Zone of Influence, if plots are to be constructed within the Zone of Influence, specialist foundation designs will be required to be submitted to the CA for an engineering appraisal.



E3P recommends the following works are undertaken to ensure that all areas of potential shallow mine workings are identified and assessed:

- ✚ Trial Trenching should be undertaken to investigate the potential presence of the mine shaft (385414-017) within the 10 m departure distance of its current recorded position. If the shaft is identified within the site boundary, treatment works would be required to stabilise the feature and a shaft cap or plug would be required at rockhead.
- ✚ A series of rotary open holes should be advanced to a nominal depth of 40 m across the site to confirm the depth to rockhead and investigate the potential presence of the Bassy/Lower Foot Coal seam and any associated shallow workings.
- ✚ Ground gas monitoring wells should be installed within selected rotary boreholes to assess the risk from mine/ground gas, or a precautionary gas membrane/mitigation measures should be installed in any new developments.
- ✚ Following the confirmation of the position of the mine shaft and the depth to rockhead a Zone of Influence/no build zone for 385414-017 should be calculated and if the proposed structure falls within this area, specialist foundation designs will require submission to the Coal Authority for an engineering appraisal.

END OF REPORT



APPENDIX I

LIMITATIONS

1. This report and its findings should be considered in relation to the terms of reference and objectives agreed between E3P and the Client as indicated in Section 1.3.
2. For the work, reliance has been placed on publicly available data obtained from the sources identified. The information is not necessarily exhaustive and further information relevant to the site may be available from other sources. When using the information it has been assumed it is correct. No attempt has been made to verify the information.
3. This report has been produced in accordance with current UK policy and legislative requirements for land and groundwater contamination which are enforced by the local authority and the Environment Agency. Liabilities associated with land contamination are complex and requires advice from legal professionals.
4. During the site walkover, reasonable effort has been made to obtain an overview of the site conditions. However, during the site walkover, no attempt has been made to enter areas of the site that are unsafe or present a risk to health and safety, are locked, barricaded, overgrown, or the location of the area has not been made known or accessible.
5. Access considerations, the presence of services and the activities being carried out on the site limited the locations where sampling locations could be installed and the techniques that could be used.
6. Site sensitivity assessments have been made based on available information at the time of writing and are ultimately for the decision of the regulatory authorities.
7. Where mention has been made to the identification of Japanese Knotweed and other invasive plant species and asbestos or asbestos-containing materials, this is for indicative purposes only and do not constitute or replace full and proper surveys.
8. The executive summary, conclusions and recommendations sections of the report provide an overview and guidance only and should not be specifically relied upon without considering the context of the report in full.
9. E3P cannot be held responsible for any use of the report or its contents for any purpose other than that for which it was prepared. The copyright in this report and other plans and documents prepared by E3P is owned by them and no such plans or documents may be reproduced, published or adapted without written consent. Complete copies of this may, however, be made and distributed by the client as is expected in dealing with matters related to its commission. Should the client pass copies of the report to other parties for information, the whole report should be copied, but no professional liability or warranties shall be extended to other parties by E3P in this connection without their explicit written agreement there to by E3P.
10. New information, revised practices or changes in legislation may necessitate the re-interpretation of the report, in whole or in part.



APPENDIX II

GLOSSARY

TERMS

ACM	Asbestos-containing material	MMP	Materials management plan
ADS	Acoustic design statement	ND	Not detected
AST	Above-ground storage tank	NDP	Nuclear density probe
BGS	British Geological Survey	NMP	Noise management plan
BSI	British Standards Institute	NPSE	Noise policy statement for England
BTEX	Benzene, toluene, ethylbenzene, xylenes	NR	Not recorded
CA	Coal Authority	PAH	Polycyclic aromatic hydrocarbon
CBR	California bearing ratio	PCB	Polychlorinated biphenyl
CIEH	Chartered Institute of Environmental Health	PI	Plasticity index
CIRIA	Construction Industry Research Association	PID	Photo ionisation detector
CLEA	Contaminated land exposure assessment	POS	Public open space
CML	Council of Mortgage Lenders	PPE	Personnel protective equipment
CoC	Contaminants of concern	ProPG	Professional practice guidance
CSM	Conceptual site model	QA	Quality assurance
DNAPL	Dense non-aqueous phase liquid (chlorinated solvents, PCB)	SGV	Soil guideline value
DWS	Drinking water standard	SPH	Separate-phase hydrocarbon
EA	Environment Agency	SPT	Standard penetration test
EQS	Environmental quality standard	SVOC	Semi-volatile organic compound
FFL	Finished floor level	TPH	Total and speciated petroleum hydrocarbon
GAC	General assessment criteria	TPH CWG	Total Petroleum Hydrocarbon (Criteria Working Group)
GL	Ground level	UKWIR	United Kingdom Water Infrastructure Risk
GSV	Gas screening value	UST	Underground storage tank
HCV	Health criteria value	VCC	Vibro-concrete column
ICSM	Initial conceptual site model	VOC	Volatile organic compound
LEL	Lower explosive limit	VRSC	Vibro-replacement stone columns
LMRL	Lower method reporting limit	VSC	Vibro-stone columns
LNAPL	Light non-aqueous phase liquid (petrol, diesel, kerosene)	WHO	World Health Organisation
MCV	Moisture condition value	WRAP	Waste and Resources Action Programme



MIBK	Methyl isobutyl ketone	WTE	Water table elevation
m	Metres	ppm	Parts per million
km	Kilometres	mg/m³	Milligram per metre cubed
% v/v	Percent volume in air	m bgl bgl	Metres below ground level
mb	Millibars (atmospheric pressure)	m bcl	Metre below cover level
l/hr	Litres per hour	mAOD	Metres above ordnance datum (sea level)
µg/l	Micrograms per litre (parts per billion)	kN/m²	Kilonewtons per metre squared
ppb	Parts per billion	µm	Micrometre
mg/kg	Milligrams per kilogram (parts per million)		



APPENDIX III

COAL AUTHORITY MINING

REPORT



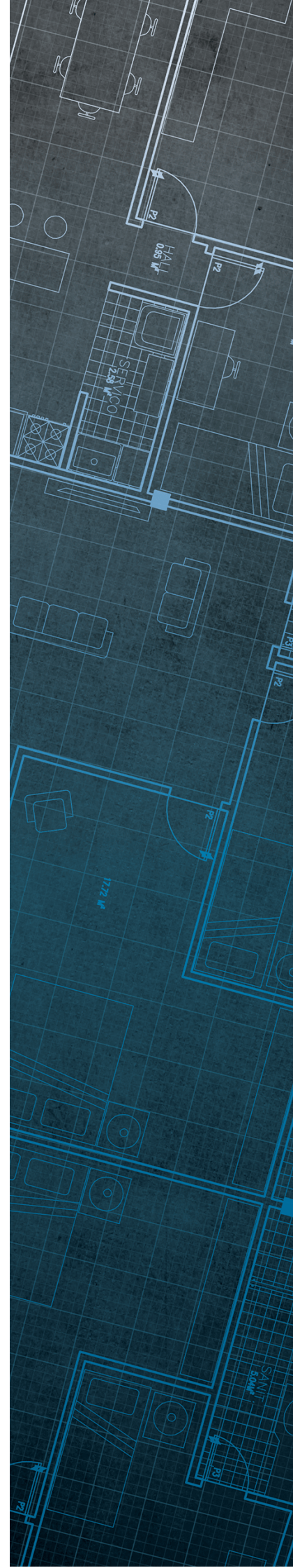
The Coal
Authority

Consultants Coal Mining Report

8 Brick Ground
Rochdale
OL12 7TN

Date of enquiry:	13 March 2023
Date enquiry received:	13 March 2023
Issue date:	13 March 2023

Our reference:	51003343608001
Your reference:	16702- 004334



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

E3P

Enquiry address

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Rochdale
OL12 7TN

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NG18 4RG

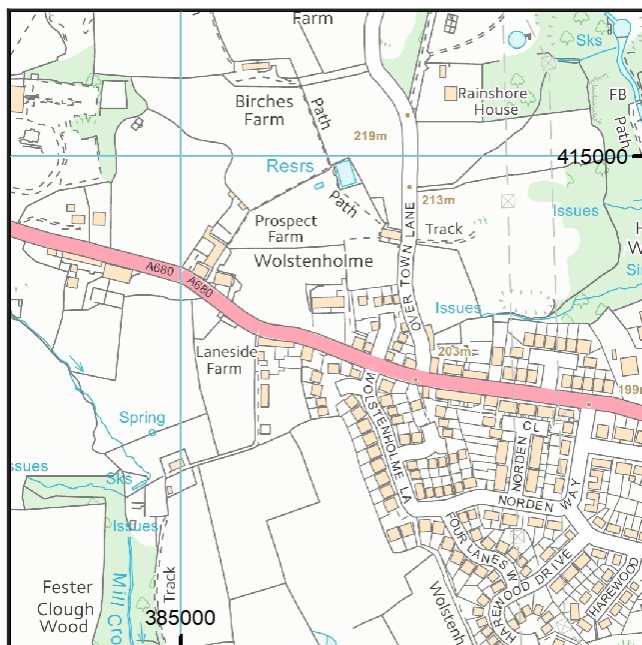
www.groundstability.com

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 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

No past mining recorded.

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	385414-017	385138 414822		Coal	

Abandoned mine plan catalogue numbers

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

0	NW160	16820
PO0		

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
SAND ROCK	Coal	Yes	13.6	East	235

Geological faults, fissures and breaklines

Please refer to the 'Summary of findings' map (on separate sheet) for details of any geological faults, fissures or breaklines either within or intersecting the enquiry boundary.

Fault under or close to the property recorded.

Opencast mines

None recorded 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 not in an area where a notice to withdraw support has been given.

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

Based on the responses in this report, no further information has been highlighted.

Future development

If development proposals are being considered, technical advice relating to both the investigation of coal and former coal mines and their treatment should be obtained before beginning work on site. All proposals should apply specialist engineering practice required for former mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or coal mines without first obtaining the permission of the Coal Authority.

MINE GAS: Please note, if there are no recorded instances of mine gas within 500m of the enquiry boundary, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded. Developers should be aware that the investigation of coal seams, mine workings or mine entries may have the potential to generate and/or displace underground gases. Associated risks both to the development site and any neighbouring land or properties should be fully considered when undertaking any ground works. The need for effective measures to prevent gases migrating onto any land or into any properties, either during investigation or remediation work, or after development must also be assessed and properly addressed. In these instances, the Coal Authority recommends that a more detailed Gas Risk Assessment is undertaken by a competent assessor.

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. Please note, if there are no recorded instances of mine gas reported, this does not mean that mine gas is not present within the vicinity. The Coal Authority Mine Gas data is limited to only those sites where a Mine Gas incident has been recorded.

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.

Key

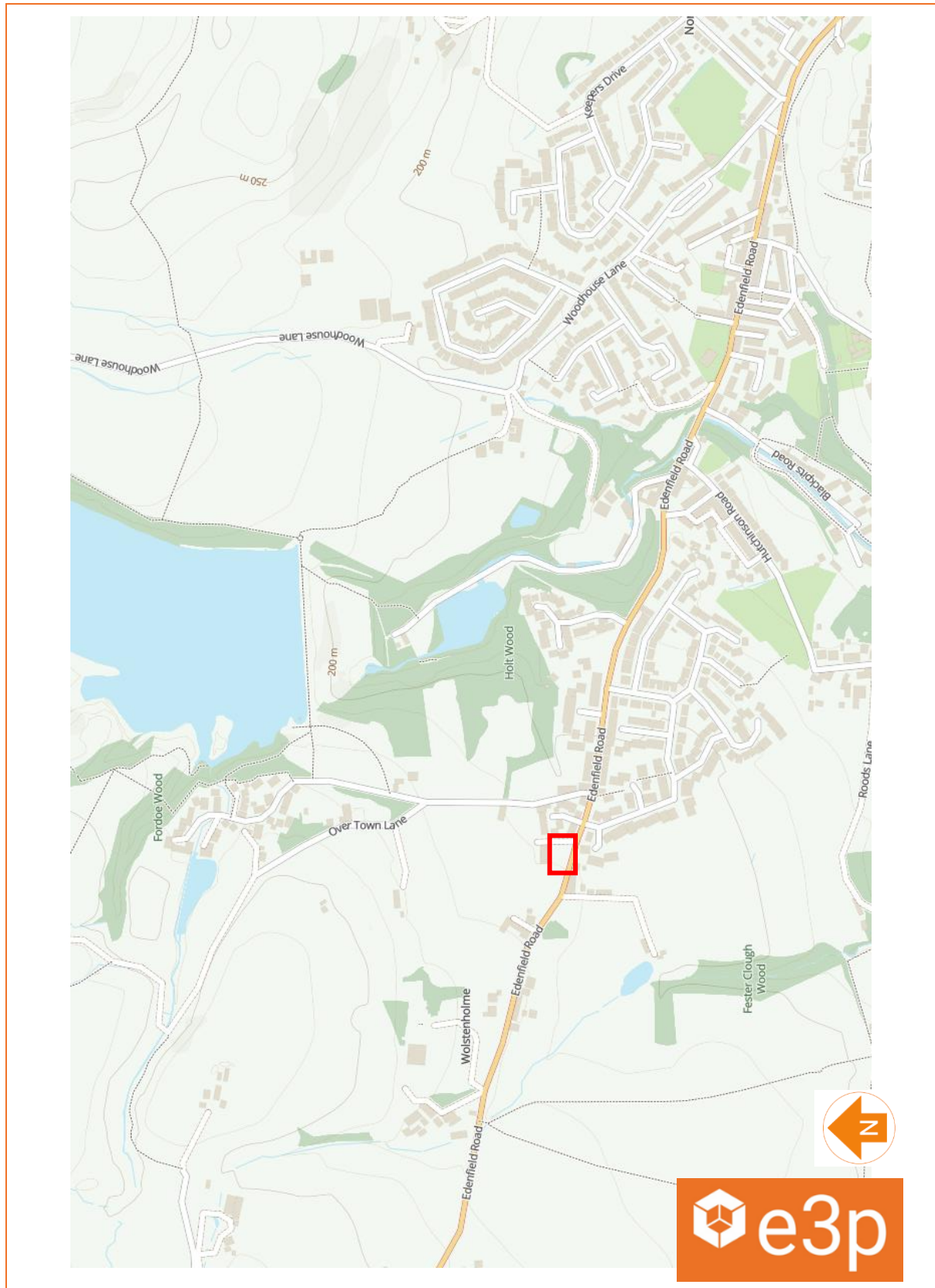
- Approximate position of the enquiry boundary shown
- Disused mine shaft
- Outcrop (Conjectured)
- Geological faults

How to contact us
0345 762 6848 (UK)
+44 (0)1623 637 000 (International)
www.groundstability.com

APPENDIX IV

DRAWINGS

DRAWING 16-702-001 – SITE LOCATION PLAN



Former Unidentified Structures
Circa 1888

Construction of Foundations
Pre 2013 - Present



Historical Features

- Former Unidentified Structures
- Construction of Foundations

Notes:

Client:

JACKSON, JACKSON &
SONS LIMITED

Job No:

16-702

Date:

24.04.2023

Drawing No:

003

Scale:

NTS



Environmental Engineering
Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

Job Title:

Edenfield Road,
Rochdale

Drawing Title:

Historical
Features Plan

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P1	REVA	24.04.2023	OW	PW
Phase	Issue	Date	Drawn	Checked

Semi Mature Trees on Boundary

Former Foundations of Historic Development



Site Features

- Former Foundations of Historical Development
- Semi Mature Trees on boundary

Notes:

Client:

JACKSON, JACKSON &
SONS LIMITED

Job No:

16-702

Date:

24.04.2023

Drawing No:

004

Scale:

NTS



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Job Title:

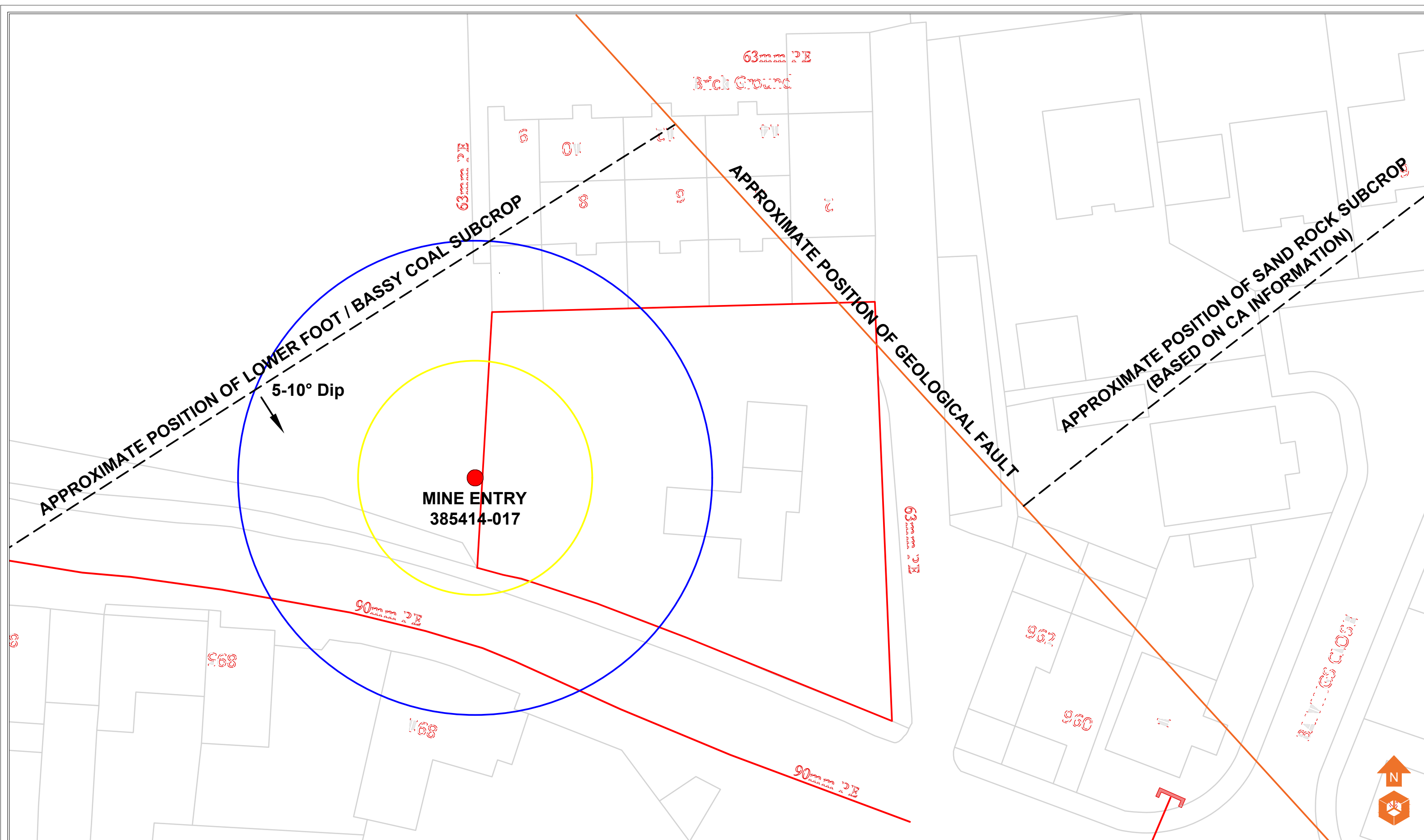
Edenfield Road,
Rochdale

Drawing Title:

Site Features
Plan

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P1	REVA	24.04.2023	OW	PW
Phase	Issue	Date	Drawn	Checked



Location Symbols

- Approximate Mine Entry Location
- 10m Departure Zone (Search Area)
- 25m No Build Zone (Worst Case)
- Approximate Position of Geological Fault
- Lower Foot / Bassy Coal Subcrop (Geological Mapping)

Notes:

P1	REVA	27.03.2023	HM	JS
Phase	Issue	Date	Drawn	Checked

Client:

JACKSON, JACKSON & SONS LIMITED

Edenfield Road, Rochdale

Job No:	16-702	Date:	27.03.2023
Drawing No:	011	Scale:	NTS

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