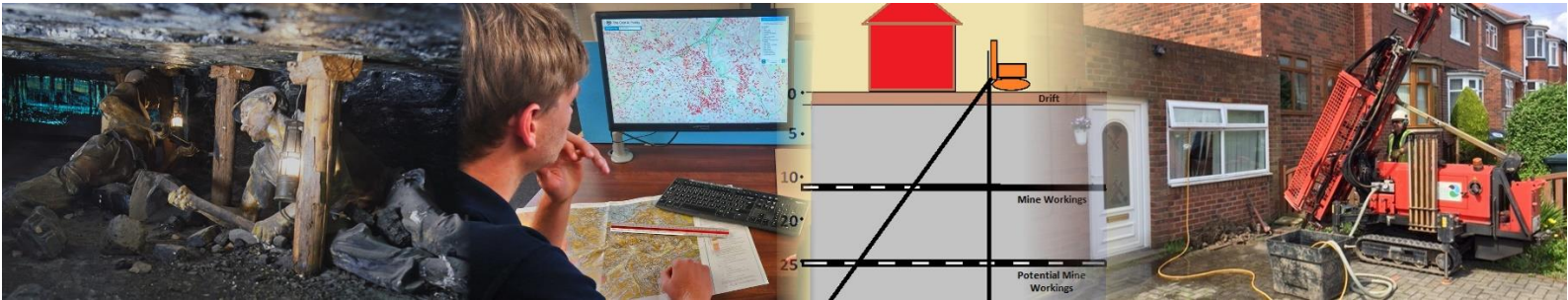




GEOLOGICAL
 GEOTECHNICAL
 GEOENVIRONMENTAL
 CONSULTANCY
 DRILLING & DATA ACQUISITION



GEOINVESTIGATE LIMITED

Coal Mining Risk Assessment (CMRA)

LOCATION	1A Longfield Road, Heckmondwike, WF16 9EJ
ISSUE DATE	8 th October 2025
FOR	Nathan Cotton
CLIENT REF.	
OUR REF.	G25323

Prepared by

Checked by

Jonathan James BSc (Hons)
 Assistant Geotechnical Engineer

Ross Nicolson BSc (Hons) MSc (Eng) CEng MIMMM
 Principal Geotechnical Engineer

1. CMRA INTRODUCTION & COAL MINING HAZARDS

1.1 Site Location and Description

The approximate centre of the site lies at E421908, N424045 with surface ground height around 99m AOD.

The boundary shown in RED on the Coal Authority (CA) report provided in Appendix A corresponds with the planning application area.

The site is currently occupied by the garden and driveway of No. 1a Longfield Road. Site images are provided in Appendix B. It is proposed to erect a detached two to three-storey dwelling in the garden as per the development plans in Appendix C. The new building is close to several large trees, and one or two smaller trees/shrubs may be removed to provide space for the new building.

1.2 Historical Maps

A desk study of the limited available historical Ordnance Survey maps dating from the mid-1800s shows the site occupied at an early time by farmland with a "Coal Pit" located nearby to the south of it as shown in Appendix B. The site remained largely undeveloped until the 1970s when presumably No.1a was erected.

No evidence of surface mining activity, clay, sand or gravel pitting or stone quarrying is recorded on the historical maps within or immediately adjacent to the property.

1.3 Anticipated Geology

The location of the property is shown on the extracts of British Geological Survey (BGS) 1:50,000 and 1:10,000 Solid and Drift geology maps (Sheet SE22SW and sheet 077 Huddersfield) both presented in Appendix D. These maps and the BGS's online GeoIndex mapping service show the site underlain by little or no thickness of superficial cover with Lower Coal Measure Formation bedrock lying at or near surface comprising mudstones, siltstones, and sandstones with subordinate coal seams.

The approximate outcrop of the Middleton Little (ML) Coal is shown within the property but may be subject to positional uncertainty hence it is indicated as a dashed line. Outcrop of the New Hards (NH) Coal/Middleton Main (MM) Coal lies further west. Because both coal seams dip broadly east, they may underlie the new building within very shallow (< 10m) and shallow depth (< 30m).

The BGS borehole logs to the southwest of the site presented in Appendix E record drift/bedrock depth up to 2m.

1.4 Mine Workings & Mine Shafts

The Coal Authority (CA) report in Appendix A identifies recorded underground mine workings in the Black Bed Coal seam beneath the site at a depth of 196m dipping 2.4° south-east last worked in 1908. In Geoinvestigate's opinion this working lies too deep to impact surface ground stability in the development area.

However, the CA report places the site in an area of probable shallow coal mine workings. The CA define Probable Unrecorded Shallow Workings as "*Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface*" (i.e., less than 30m).

Section 1.3 of Geoinvestigate CMRA identifies possible shallow mining hazards in the Middleton Little and the Middleton Main coal horizons beneath the new building.

The Coal Authority (CA) report identifies two recorded mine shafts in the vicinity of the site 421424-024 and 421424-025, the nearest 025 lying 11m south of the site boundary and the existing access road and 40m from the new house. The other shaft located 60m to the south-east is too distant to impact the development area.

CA online interactive mapping information identifies shaft depths of 16.50m and 20.10m for mine entries 025 and 024 respectively. Assuming the same coal horizon lies at the bottom of each shaft or perhaps 1m to 2m above the

bottom allowing for a water collection sump then the tentative shaft strike line construction diagram shown in Appendix F suggests this coal may be found at a depth of about 12.5m below the new house. This however is speculation.

The calculated ZOI of shaft 025 is shown in Appendix G based on 10m departure/positional uncertainty, 2m assumed diameter and 2m bedrock depth. According to the ZOI diagram this shaft does not impact ground stability in the development area so no further mitigation is required regarding this issue. However, the proximity of both shafts to the property raises further concern about possible shallow mine working at this locality.

In Geoinvestigate's opinion the possible presence of unrecorded mine working within very shallow and shallow depth beneath the proposed new building poses a significant surface ground stability risk requiring further intrusive site investigation.

1.5 Geological Faults Fissures & Breaklines

The geological mapping and the CA report do not identify any faults, fissures, or breaklines within the site or within influencing distance of it.

1.6 Mine Gas

According to the CA report no mine gas incidents or remediation have been recorded within 500m of the enquiry boundary and typically on the UK coalfields mine gas risk to surface development is low. Circumstances where gas risk increases include proximity (typically < 50m) to mine entries (adits and shafts), proximity to recorded mine gas incidents, where development is located above or adjacent to very shallow and shallow (< 30m) unroofed mine workings or roadway tunnels.

In addition, increased mine gas risk may be attributable to coal seams with a history of spontaneous combustion, natural or artificial pathways providing routes for gas migration e.g. permeable soil cover, pathways created by geological faults, mining induced breaklines/fractures, collapsed mine roof strata, mining subsidence, mining sinkholes/crown holes and unsealed boreholes.

This CMRA has indicated that conditions may exist at this site increasing mine gas risk namely the possible presence of shallow mine working and two nearby mine entries. However, the risk may be less as there has been no reported mine gas incident at this locality and typically surface mine gas mine problems are rare on the UK's coalfields.

2. RISK ASSESSMENT OF SITE-SPECIFIC COAL MINING ISSUES

The risk assessment methodology adopted in this section is based on CA publication RISK BASED APPROACH TO DEVELOPMENT MANAGEMENT - GUIDANCE FOR DEVELOPERS Version 3, 2014 and Version 4 - 2017. The template contained therein is broadly adopted in the table below with amendments made by Geoinvestigate Limited. The factual information it is based on, is derived mostly from the CA Consultants Coal Mining Report and additional desk study information including available historical maps, geological maps & memoirs, BGS boreholes, online articles etc. It is not an exhaustive desk study review. Therefore, if new information is released or found in the future, this CMRA may require updating.

The table also provides advice on next step mitigation and the likely planning decision.

RISK ASSESSMENT & MITIGATION		
Coal Mining Issues/Hazards	Risk	Next Step Mitigation/Comment
Past underground coal mining	YES	Too deep to be impact surface stability
Probable unrecorded shallow workings	M	Drilling to enable further assessment
Outcrop	YES	Drilling to enable further assessment
Spine roadways at shallow depth	NONE	
Mine entries	YES (2)	Development outside both ZOIs
Geological faults, fissures and breaklines	NONE	
Mine gas	M	Drilling and perhaps extended gas monitoring
Opencast mines within 500m	NONE	
Coal mining subsidence claims within 50m	NONE	
Site investigations within 50m	NONE	
Likely Planning Decision	Yes/No	Reason
Is planning permission likely to be given with respect to coal mining legacy issues CONDITIONAL upon carrying out further intrusive investigation leading to possible building design mitigation at a future date but before construction begins?	Yes	Yes. Because the site is NOT impacted by known mine entry proximity hazard and the site-specific ground stability and possible mine gas risks to the proposed development identified in this CMRA can be mitigated by further intrusive site investigation and (if required thereafter) routine engineering solutions.

Assessed risk level – High, Medium Low. NONE

3. CMRA OUTCOME & RECOMMENDATIONS

This CMRA has identified increased risk to the proposed development from possible shallow mine workings as well as perhaps mine gas. Drilling investigation is required to further assess both risks. However as both risks can be mitigated by routine engineering solutions **planning permission should not in our opinion be withheld with respect to coal mining legacy issues** providing further intrusive investigation is carried out at a future date and the permission is **CONDITIONED** accordingly.

In Geoinvestigate’s opinion a minimum of 3 rotary open boreholes (without need for core sample recovery) should be sunk at the site to depths up to 30m (but not necessarily reaching 30m) to establish bedrock depth and mine workings depth (if any) beneath the site.

A Coal Authority Permit needs to be obtained (ahead of) further intrusive exploratory drilling. As per the table below Water Drill Flush to be used when drilling. The permit application must state **WATER ONLY DRILL FLUSH** for the safety of the public and drill crew. **Failure to do so may result in prosecution by the HSE and a hefty fine.**

Risks for Different Drilling Scenarios					
Air flush	Mist flush	Foam flush	Water flush	Mud flush	Additional controls
HIGH	HIGH / MED'M	HIGH / MED'M	LOW	LOW	<ul style="list-style-type: none"> Monitoring at rig and other open holes. Seal boreholes

Boreholes must be sealed on completion.

Gas monitoring **MUST** be carried out during drilling and may provide further indication of mine gas risk.

However, because of the proximity of a mine entry to the site and if drilling investigation encounters shallow mine working longer term gas monitoring in specially installed gas wells may be required to further assess the ground gas risk to this development.

Alternatively, longer term gas monitoring may be avoidable if the installation of precautionary gas protection measures are included in the design of the new buildings in line with “Characteristic Situation 2” (CS2) based upon the

CIRIA 665 (revised) report – “Assessing the risks posed by hazardous ground gases to buildings”. However, agreement will be required from the Local Planning Authority for this alternative proposal.

Further shallow geotechnical and geoenvironmental site investigation is also required to enable the foundation design in respect of the proximity of trees and to check the land for the presence of ground contamination though in this instance the latter is not expected to be problematic.

WHAT TO DO NEXT? Obtain quotes for the intrusive site investigation works. The cost of the SI works should be a **“lump sum” fixed price**. Geoinvestigate can provide advice and assistance with helping you find suitable site investigation & drilling contractors. Call us on 01642 713779 or email enquiries@geoinvestigate.co.uk.

Appendices:

- A. CA Consultants Coal Mining Report issued 2nd October 2023 ref. 5100352889100.
- B. Site Location Images & Historical OS Map
- C. Proposed Development
- D. Geology Map Extracts
- E. BGS Borehole Records
- F. Mine Shaft Strike Line Diagram
- G. Mine Shaft ZOI

APPENDIX A
COAL MINING REPORT



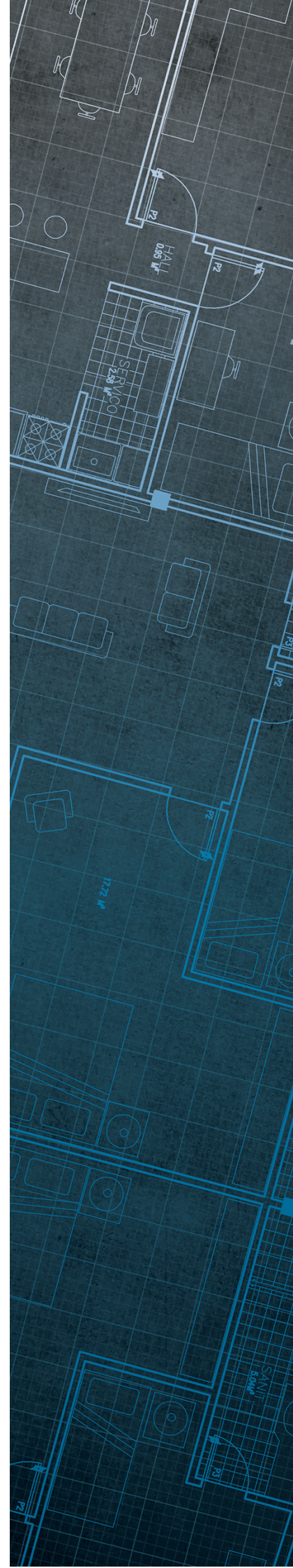
The Coal
Authority

Consultants Coal Mining Report

Forrest Way
1A Longfield Road
Heckmondwike
Kirklees
WF16 9EJ

Date of enquiry: 2 October 2025
Date enquiry received: 2 October 2025
Issue date: 2 October 2025

Our reference: 51003528891001
Your reference: G25323



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

GEOINVESTIGATE

Enquiry address

Forrest Way
1A Longfield Road
Heckmondwike
Kirklees
WF16 9EJ

How to contact us

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+44 (0)1623 637 000 (International)

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Mansfield
Nottinghamshire
NG18 4RG

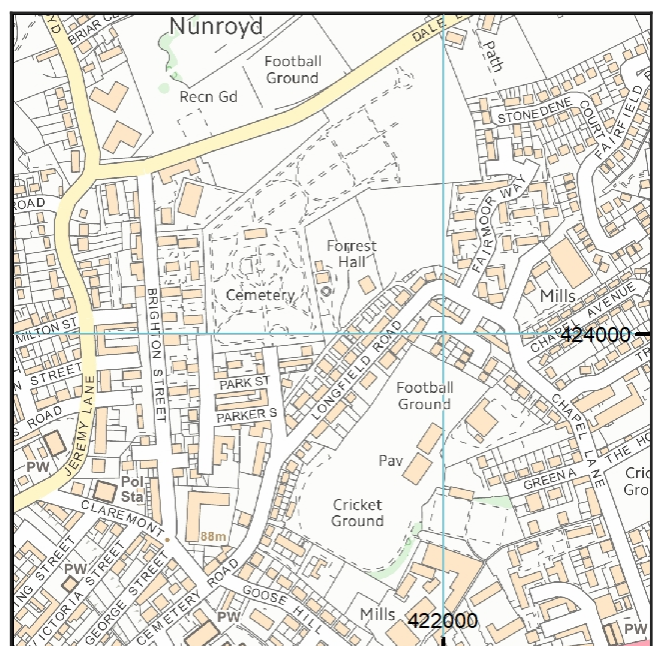
www.groundstability.com

 @coalauthority

 /company/the-coal-authority

 /thecoalauthority

 /thecoalauthority



Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

Colliery	Seam	Mineral	Coal Authority reference	Depth (m)	Direction to working	Dipping rate of seam worked (degrees)	Dipped direction of seam worked	Extraction thickness (cm)	Year last mined
unnamed	BLACK BED	Coal	6HFE	196	Beneath Property	2.4	South-East	69	1898
unnamed	BLACK BED	Coal	6HF6	198	Beneath Property	2.4	South-East	69	1908
unnamed	BLACK BED	Coal	6ZLO	203	East	2.4	South-East	69	1889
unnamed	BLACK BED	Coal	6O4W	207	South-East	2.4	South-East	69	1908

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	421424-024	421985 424015	was located and capped by ARP Associates in 1998.	Coal	
Shaft	421424-025	421910 424006	Treatment details unknown.*	Coal	

*For your information, before the coal industry was nationalised in 1947, there was no requirement for a mine operator to record mine entry treatment details when a mine was abandoned. Therefore, it is not unusual for us to have no treatment details for many of the 176,000 recorded mine entries on our database. Despite this lack of information, please be assured that the fact we have no treatment recorded does not necessarily mean that the mine entry was left untreated when abandoned.

Abandoned mine plan catalogue numbers

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

FGB427	5253	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
MIDDLETON LITTLE	Coal	Yes	Within	N/A	319

Geological faults, fissures and breaklines

No faults, fissures or breaklines 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

The following potential risks have been identified and as part of your risk assessment should be investigated further.

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.

Development advice

The site is within an area of historical coal mining activity. Should you require advice and/or support on understanding the mining legacy, its risks to your development or what next steps you need to take, please contact us.

For further information on specific site or ground investigations in relation to any issues raised in Section 4, please call us on 0345 762 6848 or email us at groundstability@coal.gov.uk.

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.

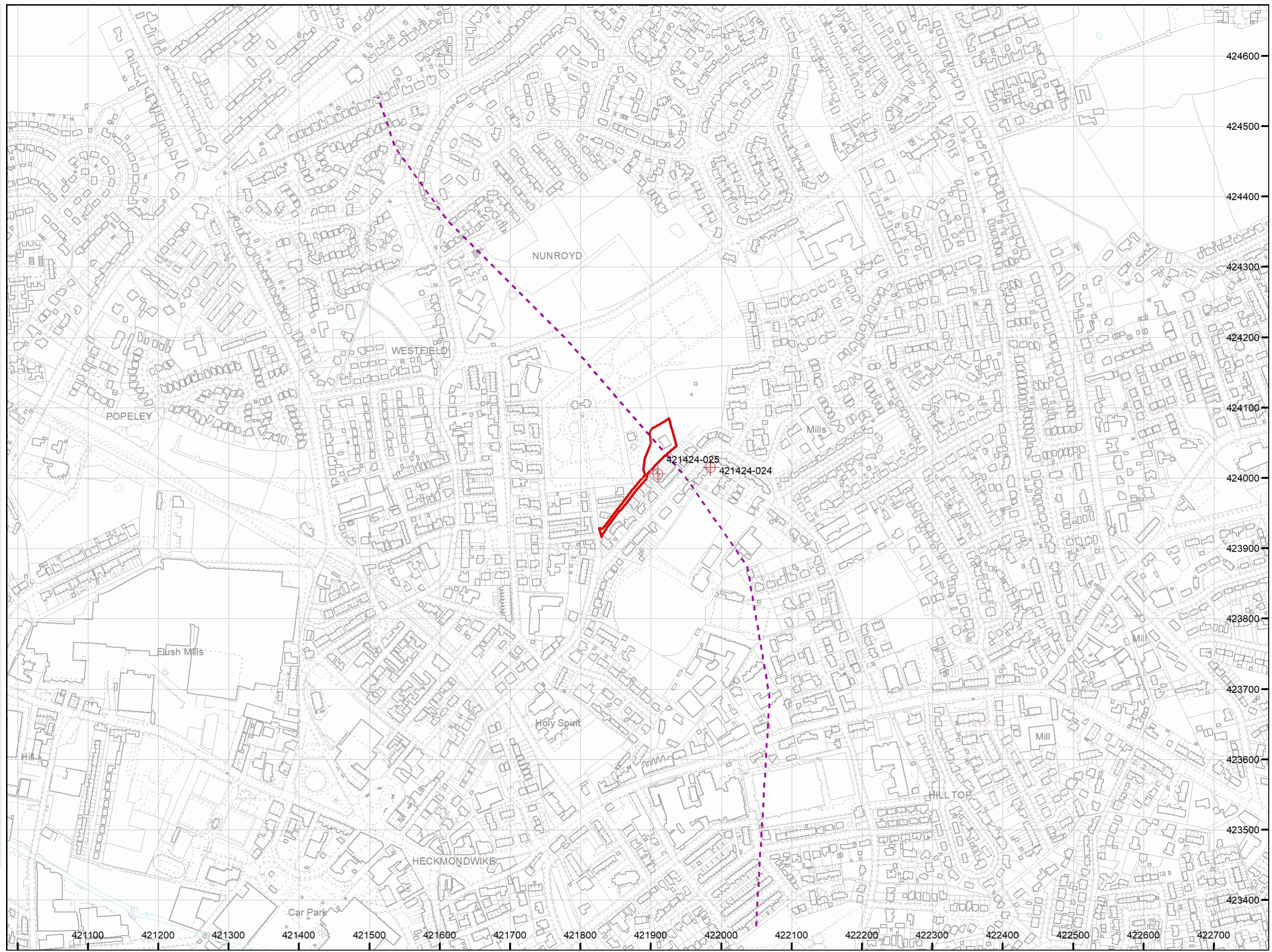
Payment to owners of former copyhold land

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.

The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

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



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

APPENDIX B

SITE LOCATION, IMAGES & HISTORICAL OS MAP



Forrest Way, 1a, Longfield Road, Heckmondwike, Kirklees, WF16 9EJ



Location Plan shows area bounded by: 421803.13, 423890.62, 422003.13, 424090.62 (at a scale of 1:1250). OSGridRef: SE21902399. The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

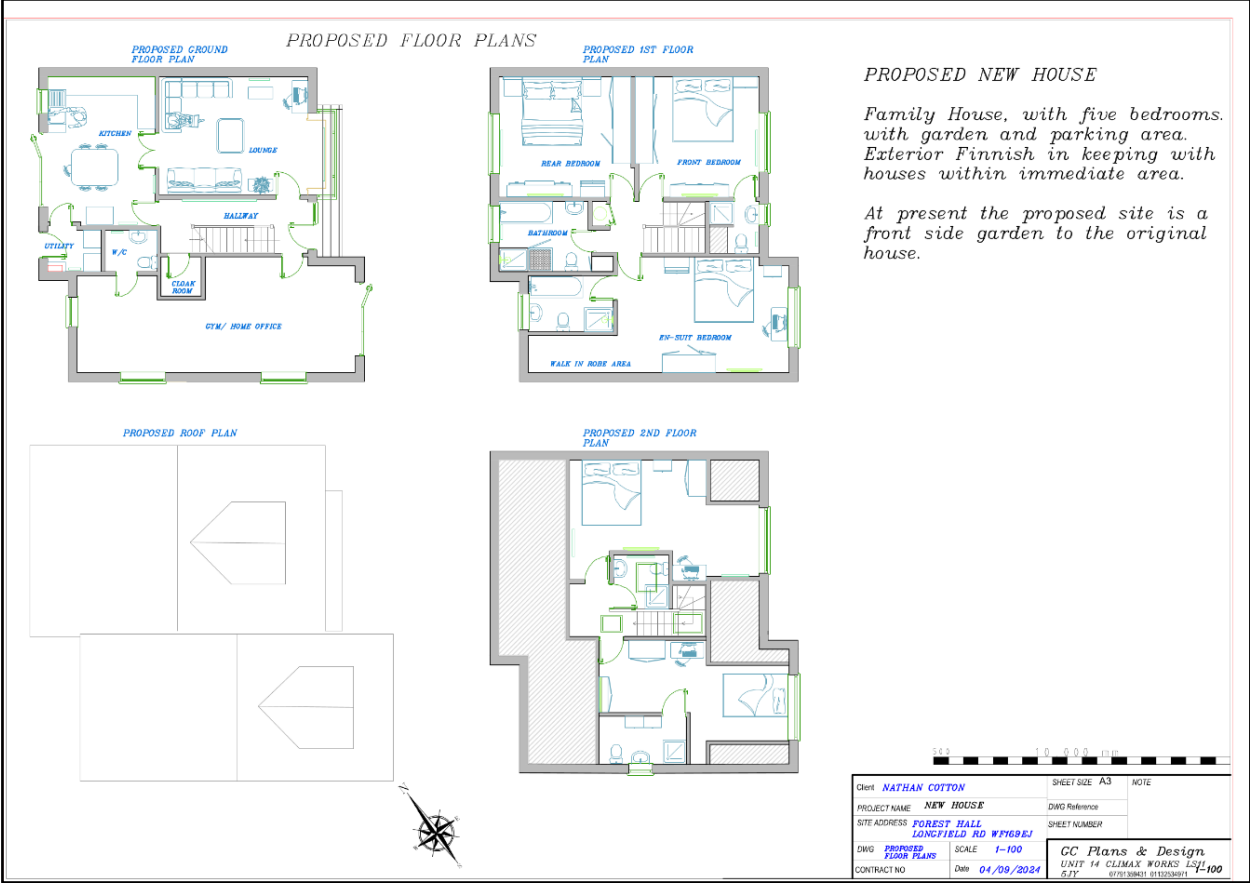
Produced on 1st Oct 2024 from the Ordnance Survey National Geographic Database and incorporating surveyed revision available at this date. Reproduction in whole or part is prohibited without the prior permission of Ordnance Survey. © Crown copyright 2024. Supplied by www.buyaplan.co.uk a licensed Ordnance Survey partner (10003143). Unique plan reference: 800930236-EE3065.
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APPENDIX C PROPOSED DEVELOPMENT

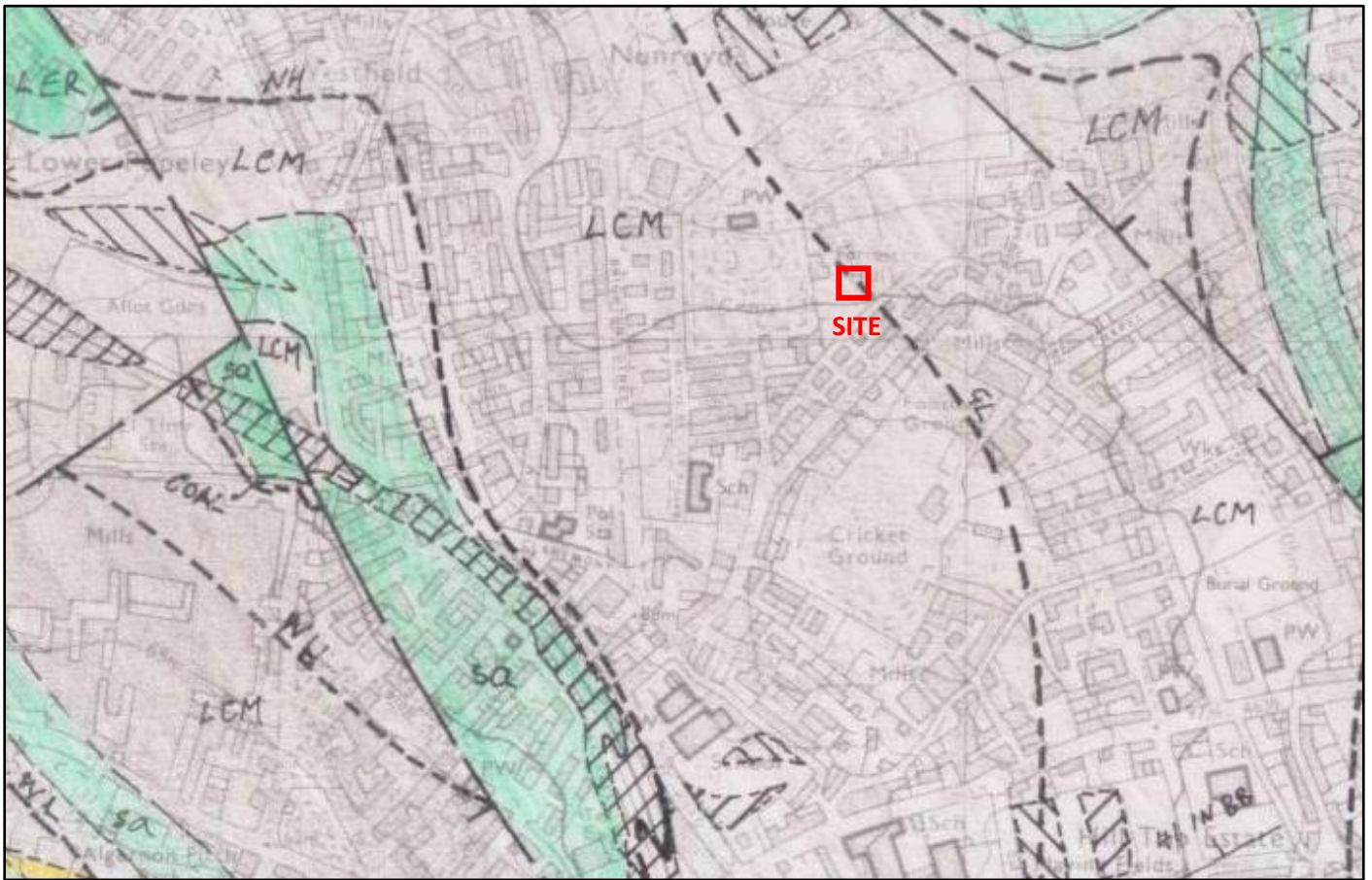


PROPOSED NEW HOUSE

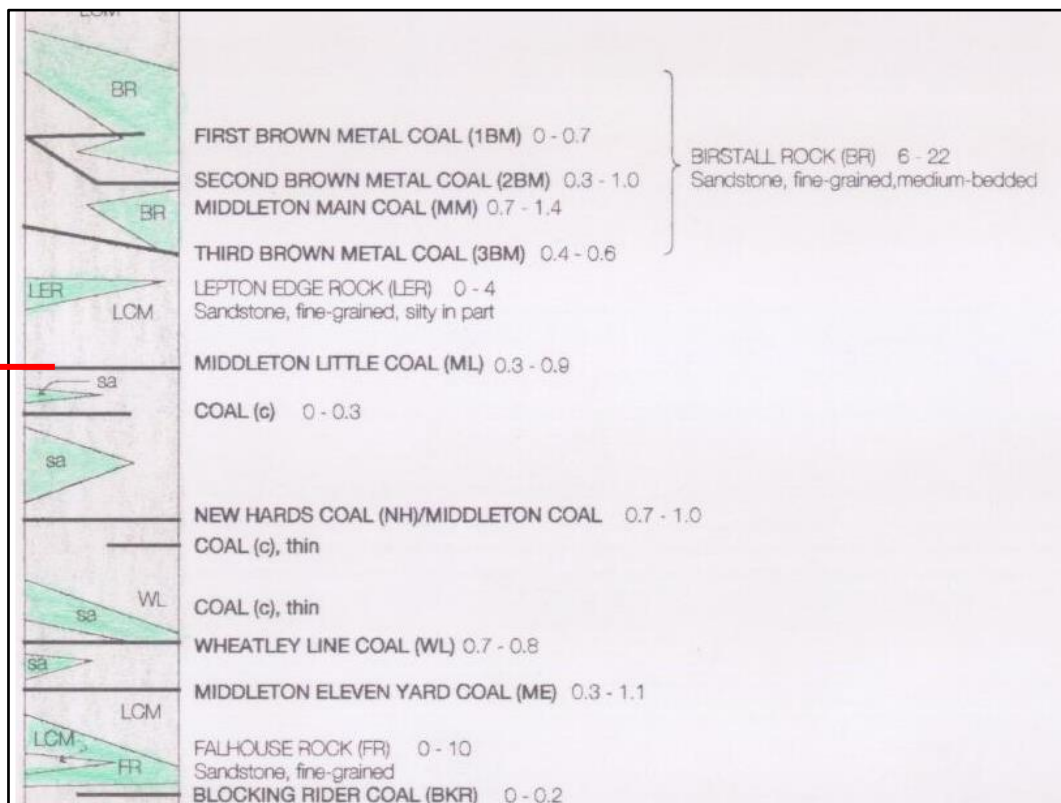
Family House, with five bedrooms, with garden and parking area. Exterior Finnish in keeping with houses within immediate area.

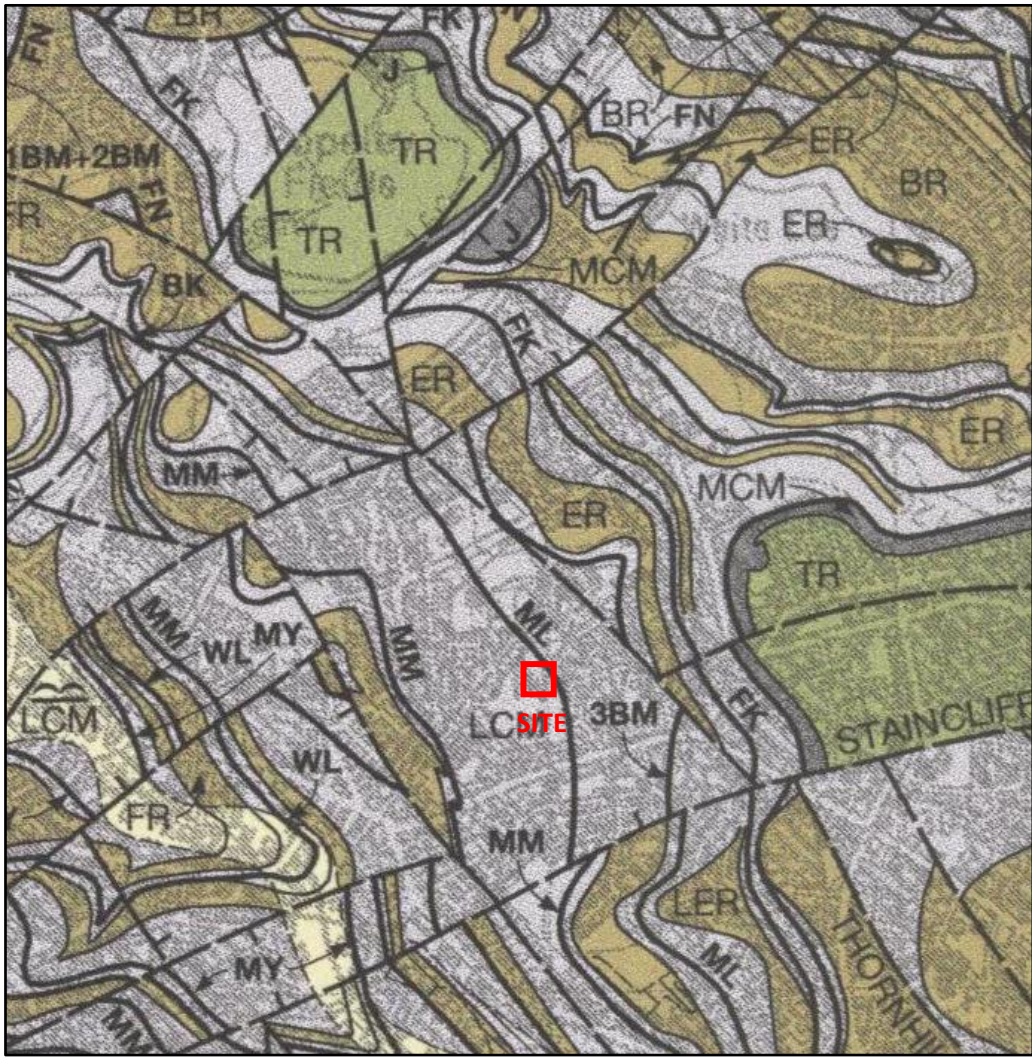
At present the proposed site is a front side garden to the original house.

APPENDIX D GEOLOGY MAP EXTRACTS



**TENTATIVE
SITE
ELEVATION**



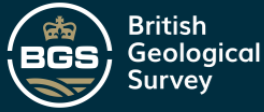


TENTATIVE
SITE
ELEVATION

FK	FLOCKTON THICK COAL (FK) 0.3 to 1.5 m
ER	EMLEY ROCK (0 to 12 m)
FN	FLOCKTON THIN COAL (FN) 0.3 to 1.4 m
1BM	FIRST BROWN METAL COAL (1BM) 0 to 0.8 m
BR	BIRSTALL ROCK (0 to 45 m)
2BM	SECOND BROWN METAL COAL (2BM) 0 to 1.0 m
3BM	THIRD BROWN METAL COAL (3BM) 0 to 0.8 m
LER	LEPTON EDGE ROCK (0 to 10 m)
ML	MIDDLETON LITTLE COAL (ML) 0.2 to 0.9 m
sa	
LCM	
MM	MIDDLETON MAIN COAL (MM) 0.2 to 1.8 m
sa	
WL	WHEATLEY LIME COAL (WL) 0.4 to 1.2 m
MY	MIDDLETON ELEVEN YARDS COAL (MY) 0 to 1.1 m
FR	FALHOUSE ROCK (0 to 12 m)
BKR	BLOCKING RIDER COAL (BKR) 0 to 0.2 m
BK	BLOCKING COAL (BK) 0.2 to 1.7 m
TL	Low 'Estheria' Band
E	TOP LOUSEY COAL (TL) 0 to 0.8 m
sa	
Tr	TRUB COAL (Tr) 0 to 0.5 m

APPENDIX E

BGS BOREHOLE RECORDS



BGS ID: 77897 : BGS Reference: SE22SW413
 British National Grid (27700) : 421680,424270

HOLST & CO. LTD.

SITE INVESTIGATION DEPT.

PARKSIDE LANE
LEEDS LS115SX.

SE22SW 413
 2168 2427

Contract No. L3867/F1568

Borehole No.

Location Hocknondwike

Ground Level

Client West Riding County architect

Date 13.5.70

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/sq. ft.	φ deg.	m.c %	γ lb/cu. ft.	N
Topsoil		10"	10"	1'3"					
Firm - stiff brown grey silty clay			5'8"	[No Test				
				4'0"	[20.5	6°	16.0	10%
		6'6"							
Soft sandstone with layers of clay		7'6"	1'0"	7'6"					
Sandstone		8'0"	6"	I					30 for 4"
Water Struck at		None Encountered			Maximum Observed Water Level				



HOLST & CO. LTD.

SITE INVESTIGATION DEPT.

PARKSIDE LANE

LEEDS LS115SX.

SE22SW 416.

Contract No. L3867/F1568

Borehole No. 6 Rotary

Location Heckmondwike

Ground Level

Client West Riding County Architect,

Date 30.6.70

BOREHOLE LOG

STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/sq. ft.	ϕ deg.	m.c. %	γ lb/cu. ft.	N
Topsoil		6"	6"						
Stiff clay		6'0"	5'6"						
Weathered sandstone		8'0"	2'0"						
Brown, grey shaley mudstone weathered at upper levels.									
			42'0"						
			50'0"						
Water Struck at 43'0" Seepage at 38'0"					Maximum Observed Water Level -				
Undisturbed Sample	<input type="checkbox"/>				c = Cohesion				
Disturbed Sample	<input type="radio"/>				ϕ = Angle of Internal Friction				
Water Sample	Δ				m.c. = Moisture Content				
Penetration Test	I				γ = Bulk Density				
				N = Standard Penetration Value					
Water levels are subject to seasonal or tidal variation and should not be taken as constant									



DUNELM DRILLING CO.

BOREHOLE RECORD

Contract No. C2965 Client WAKEFIELD M.D.C.
Ground Level..... Location HECKMONDWAKE POLICE STN
Date MARCH 1986 BOREHOLE No. 2

Depth	Thick-ness	Legend	Description of Strata	Type of Sample	C kN/m ²	M %	Ø	Density Kg/m ³	N
0.40	0.40		TALMAC ON SANDSTONE SUBBASE	U					
				0.75	197.2	19.0	-	2200	
	2.00		Very STIFF Lt Brown & Grey MOTTLED SHALEY CLAY	U					
				2.00	305.4	14.0	-	2220	
2.40			FIRM FRIABLE DK SHALES WITH THIN COAL BANDS.	P					51
3.10	0.70			3.00					
	0.90		HARD GREY MUDSTONES.	P					
4.00				4.00	FOR 0.10" PENETRATION				36

Water Struck at NIL Standing Water Level



DUNELM DRILLING CO.

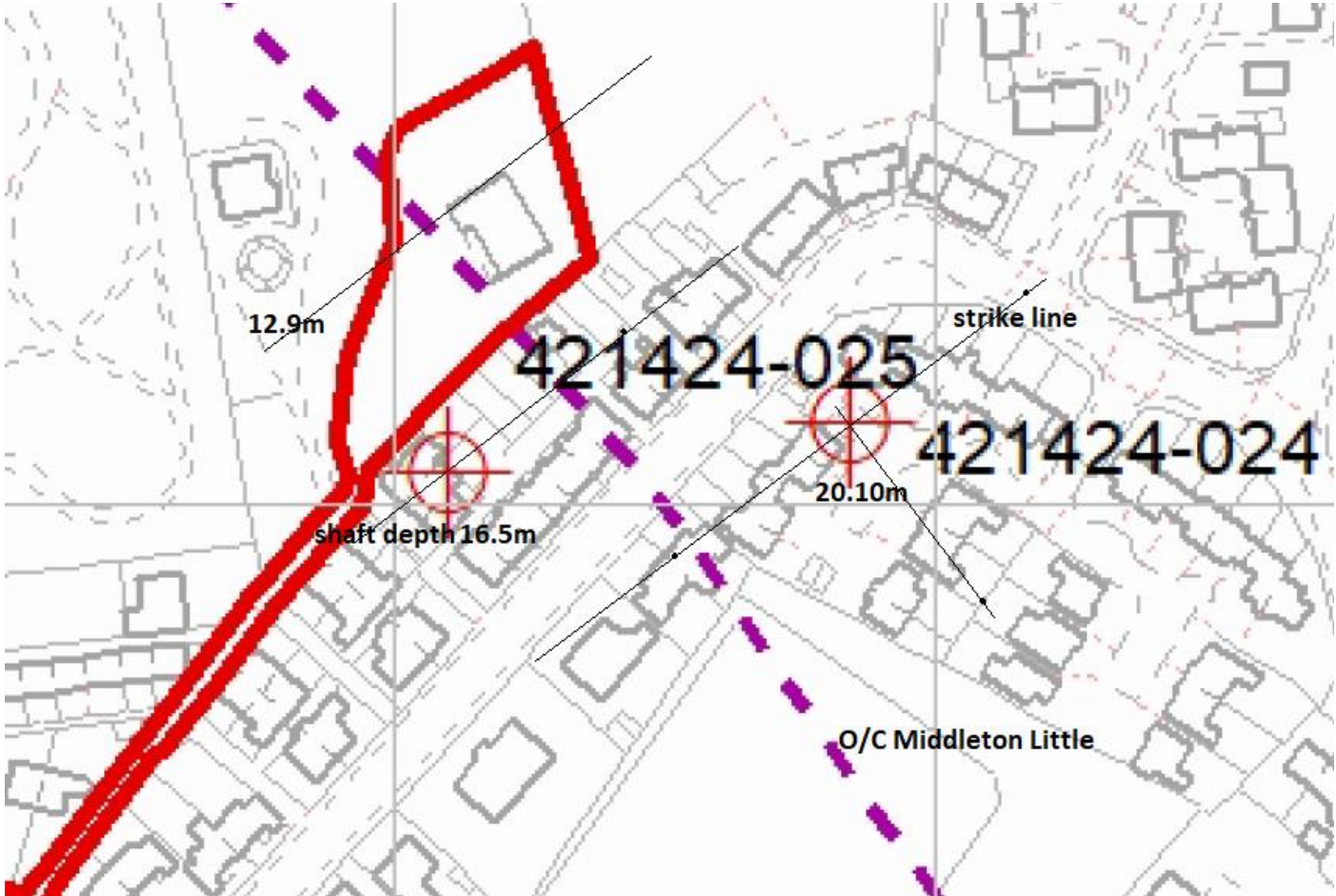
BOREHOLE RECORD

Contract No. C4215 Client CITY OF WAILEFIELD MDC
Ground Level _____ Location HECKMONDRIKE POLICE STATION
Date MARCH 1990 BOREHOLE No. 2

Depth	Thick-ness	Legend	Description of Strata	Type of Sample	C kN/m ²	M %	Ø	Density Kg/m ³	N
0.10	0.10		TARMAC						
0.40	0.30		BRICK RUBBLE HARDCORE						
	1.50		FIRM BROWN & GREY MOTTLED CLAY WITH SOME SMALL STONES	U 0.75	172.1	15.0	-	2120	
1.90	0.70		HARD GREY SHALE	U 1.50	184.3	30.0	-	2110	
2.00	1.00		QUITE HARD BANDS OF BLACK SANDY SHALE & POOL COAL	P 2.50					S1
3.00									
SECTION THRU' TRIM PIT N° 2									
<p>SANDSTONE BLOCKS BASED ON MOTTLED CLAY WITH A FEW STONES - DRY WITH QUITE A LOT OF ROOTS IN EVIDENCE</p>									

Water Struck at NONE Standing Water Level NIL

APPENDIX F
MINE SHAFT STRIKE LINE CONSTRUCTION



APPENDIX G

MINE SHAFT ZOI FOR 2m BEDROCK DEPTH



-  Mine Shaft
-  Departure
-  ZOI 2m Drift
-  Site Boundary

