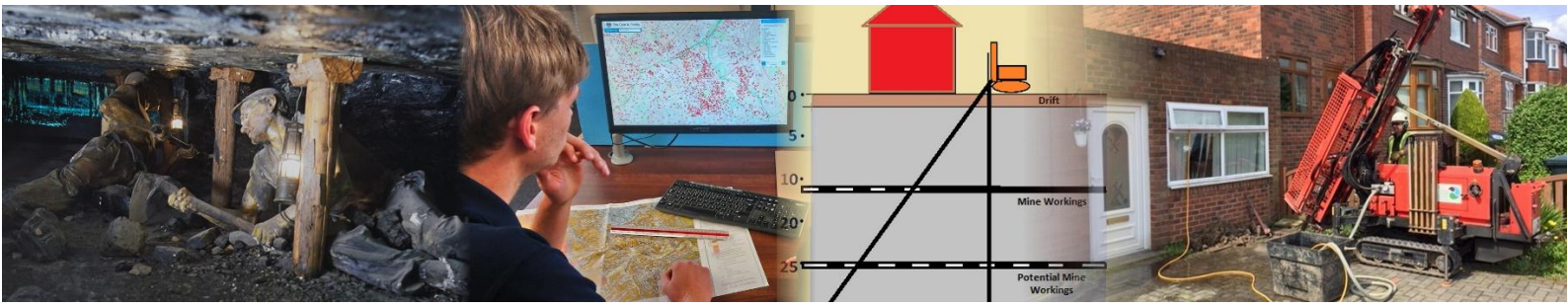
GEOLOGICAL
GEOTECHNICAL
GEOENVIRONMENTAL
CONSULTANCY
DRILLING & DATA ACQUISITION



GEOINVESTIGATE LIMITED

Coal Mining Risk Assessment (CMRA)

LOCATION	Land At Town House Farm, Town House Road, Littleborough Rochdale OL15 9JX
ISSUE DATE	8th July 2026
FOR	Happy Hideaway
CLIENT REF.	
OUR REF.	G26200

Prepared by

Jonathan Jones BSc (Hons),
Assistant Geotechnical Engineer

Checked by

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 E393605, N417168 with surface ground height around 155m AOD. The site occupies a gradual slope falling to the east and Townhouse Cottage.

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 an irregularly shaped, undeveloped parcel of land. Site images are provided in Appendix B. It is proposed to develop the site as an outdoor wellness space comprising - wood-fired sauna, cold plunge baths, wood-fired hot tub, with associated changing facilities, as per the development plan in Appendix C.

1.2 Historical Maps

A review of the limited available historic Ordnance Survey mapping indicates the site has remained undeveloped throughout the period of available coverage. The earliest mapping (c.1798–1878) shows a colliery and associated coal pits to the distant southeast of the site, while later editions from the early 1900s show Hill Top Colliery and several mine shafts to the northeast.

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

1.3 Anticipated Geology

The location of the property is shown on the extract of British Geological Survey (BGS) 1:10,000 Solid and Drift geology map (Sheet SD91NW) presented in Appendix D. This mapping, together with the BGS's GeoIndex online mapping platform indicates the site is underlain by an unknown thickness of Devensian Till (Diamicton/Boulder Clay), in turn underlain by Pennine Lower Coal Measures Formation bedrock comprising interbedded mudstones, siltstones, sandstones and coal seams. A major northwest-southeast trending fault is shown immediately south of the site, with the site located on the upthrown side of the fault. The presence of this fault is likely to locally complicate the subsurface geological sequence and may perhaps result in variations in bedrock depth and coal stratigraphy across the development area.

Discrepancies were identified between the BGS 1:10,000 mapping and Mining Remediation Authority (MRA) mapping with respect to the interpreted positions of faults and coal seams. The MRA mapping identifies several coal seam outcrops not depicted on the current BGS mapping, including the Upper Foot Coal/Bullion plotted directly beneath the site, the Upper Mountain Coal to the east of the property and the Lower Mountain Coal to the south. Subsequent review established that these seam outcrops correlate with those shown on the historic BGS 1:10,560 scale geological sheet dated 1925 (Lancashire 81 SW; Appendix D). The observed discrepancies are therefore considered likely to reflect differences in mapping age and subsequent geological reinterpretation. As a result, uncertainty remains regarding the precise coal seams present beneath the site.

According to BGS mapping, the Upper Foot/Bullion Coal is 0.30m to 0.40m thick and based on its narrowness, it is Geoinvestigate's opinion that it may not have been worked at this locality this however is speculation. According to the geology column in Appendix D the Lower Mountain Coal may lie 15.50m below the Upper Foot Coal.

BGS log SD91NW120, situated approximately 100m east, records 8m of superficial deposits with no bedrock encountered, indicating a substantial thickness of unconsolidated material overlying the bedrock which may also be present within the development area.

1.4 Mine Workings & Mine Shafts

The CA report in Appendix A does not identify any levels of past recorded underground mining beneath the site.

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).

The CA identifies outcrop of the Upper Four Foot (aka Bullion Coal) within the site boundary. According to the CA this coal is workable. Following review of the available geological mapping (Section 1.3), it is considered possible that this plotted outcrop position is inaccurate and taken from older 1:10,560 scale geological mapping superseded by later reinterpretation.

The extract of Coal Authority online interactive mapping for the site locality, provided in Appendix E, shows the coal seam outcrops are plotted in positions consistent with those shown on the historic 1:10,560 scale geological mapping. Discrepancies between modern BGS mapping and older 1:10,560 geological mapping raise uncertainty regarding the precise positions of coal seam outcrops. In particular, the Upper Four Foot Coal, which the Coal Authority considers a workable seam, may be present at or close to shallow depth beneath the site.

Encouragingly the CA report does not identify any known mine shafts within 100m of the site boundary.

Although no recorded workings are identified directly beneath the site, the Coal Authority classifies the area as one of probable unrecorded shallow workings, indicating that coal extraction may have taken place at depths of less than 30m. In Geoinvestigates opinion, the potential presence of unrecorded very shallow and shallow coal mine workings beneath the proposed development area represents a significant potential ground-stability risk to the development. Therefore, to appropriately characterise and mitigate this risk it is, Geoinvestigate's opinion, that intrusive site investigation is required.

1.5 Geological Faults Fissures & Breaklines

A major northwest-southeast-trending fault is shown on the 1:10,000 BGS map immediately south of the site, placing the site on the upthrown side, while the MRA 'Summary of Findings' map plots the same structure crossing the southwestern portion of the site. In some settings, such faults (particularly where they coincide with historical mining) can provide preferential pathways for mine-gas migration to the surface though typically this problem is rare.

1.6 Mine Gas

According to the CA report no mine gas incident 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) unflooded 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 very shallow mine workings and the site's proximity to a major fault. However, the risk may be less as there has been no reported mine gas incident at this locality and typically on the UKs coalfields surface mine gas is rarely a problem.

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**
Past underground coal mining	**NONE**		
Probable unrecorded shallow workings	**L**	**M**	Drilling to enable further assessment
Outcrop	**L**	**M**	Drilling to enable further assessment
Spine roadways at shallow depth	**NONE**		
Mine entries	**NONE**		
Geological faults, fissures and breaklines	**L**		Drilling to enable further assessment
Mine gas	**L**	**M**	Drilling to enable further assessment
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 further intrusive investigation and (if required thereafter) by 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 2 or 3 rotary open boreholes (without need for core sample recovery) should be drilled at the site, to depths up to 30m (but not necessarily reaching 30m) to establish bedrock depth and depth to any mine workings, 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	• 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, if the 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.

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.

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 28th May 2026 ref. 51003573245001
B. Site Images
C. Proposed Development
D. Geology Map Extracts
E. CA Online Information
F. BGS Borehole Record

APPENDIX A
COAL MINING REPORT

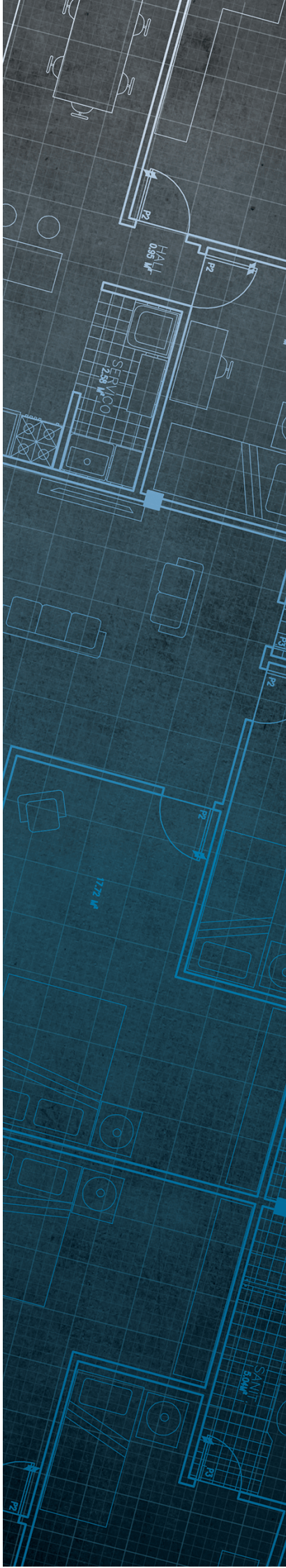
The Coal Authority

Consultants

Coal Mining Report

Land At
Townhouse Farm
Town House Road
Littleborough
Rochdale
OL15 9JX

Date of enquiry:	**28 May 2026**
Date enquiry received:	**28 May 2026**
Issue date:	**28 May 2026**
Our reference:	**51003573245001**
Your reference:	**G26200**



Consultants

Coal Mining Report

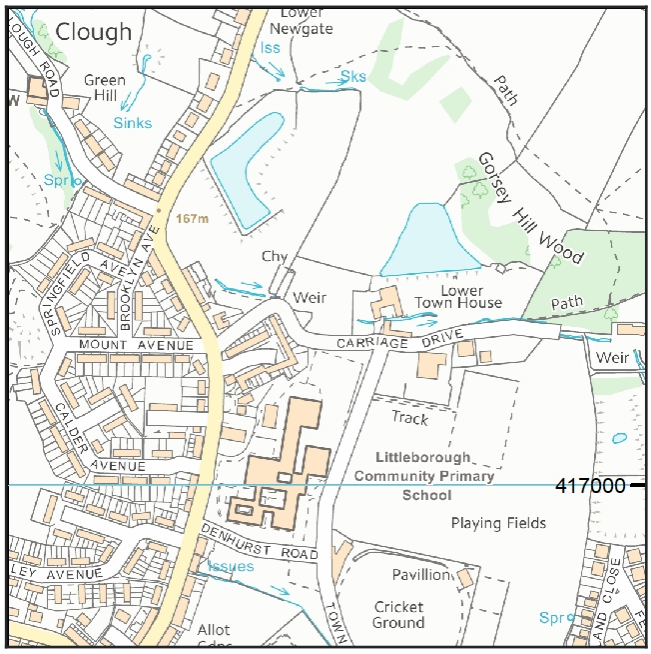
This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

GEOINVESTIGATE

Enquiry address

Land At
Townhouse Farm
Town House Road
Littleborough
Rochdale
OL15 9JX



Approximate position of property

Map data

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Mansfield
Nottinghamshire
NG18 4RG

reports@miningremediation.gov.uk

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
None recorded within 100 metres of the enquiry boundary.

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

NW1230	16820	5541

For assistance in identifying the specific abandoned mine plans relevant to your requirements, **please contact us at InformationManagers@MiningRemediation.gov.uk**.

Outcrops

Seam name	Mineral	Seam workable	Distance to outcrop (m)	Direction to outcrop	Bearing of outcrop
UPPER FOOT	Coal	Yes	Within	N/A	139

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.

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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.

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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.

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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.

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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 **email us at reports@miningremediation.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.

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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.

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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.

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The Coal Authority

Summary of findings

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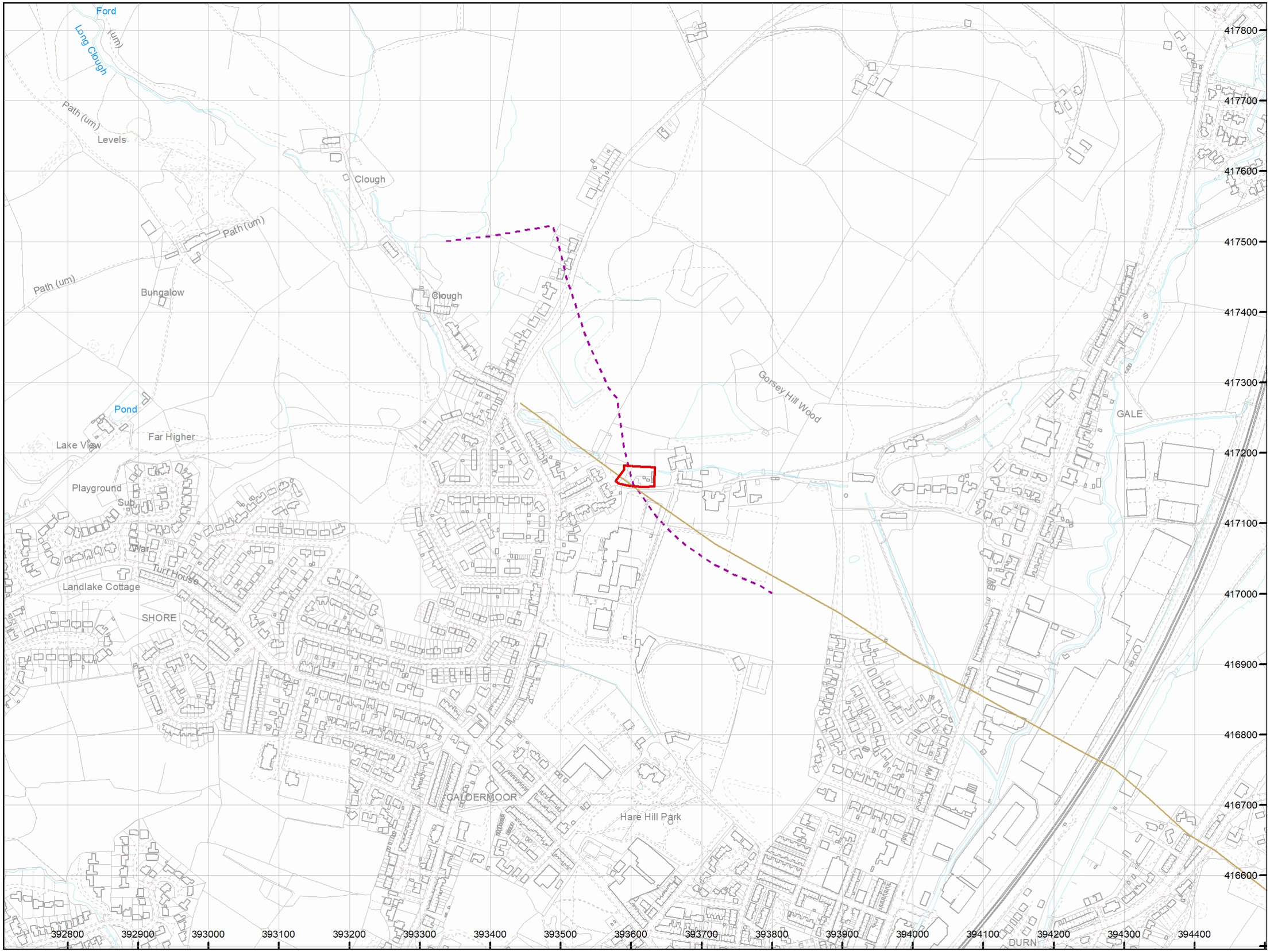
The map highlights any specific surface or subsurface features within or near to the boundary of the site.

Key

Approximate position of the enquiry boundary shown

Outcrop (Conjectured)

Geological faults



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APPENDIX B
SITE IMAGES







APPENDIX C
SITE LOCATION & PROPOSED DEVELOPMENT

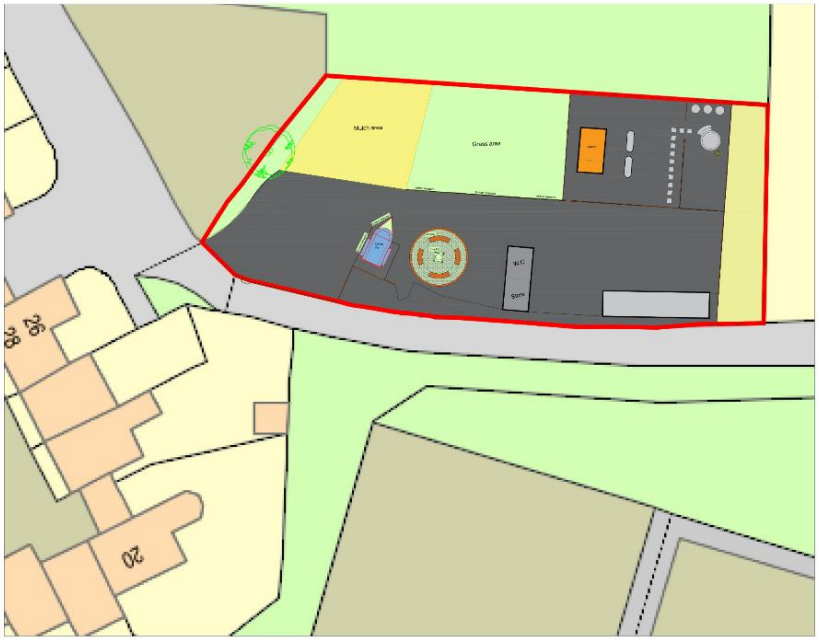


Site Location Plan Scale 1:500

NOTE
Red line indicates Land Area of Happy Hide-a-way

PLANNING DRAWING

Project:	**Happy Hideaway** Townhouse Road, Littleborough OL15 9JX
Title:	Site Location Plan
Client:	Gemma Whamby
Drawn By:	WRS on 01/06/2026
Original Size:	A2 Project Number: 2026 / 01
Drawing Number:	01



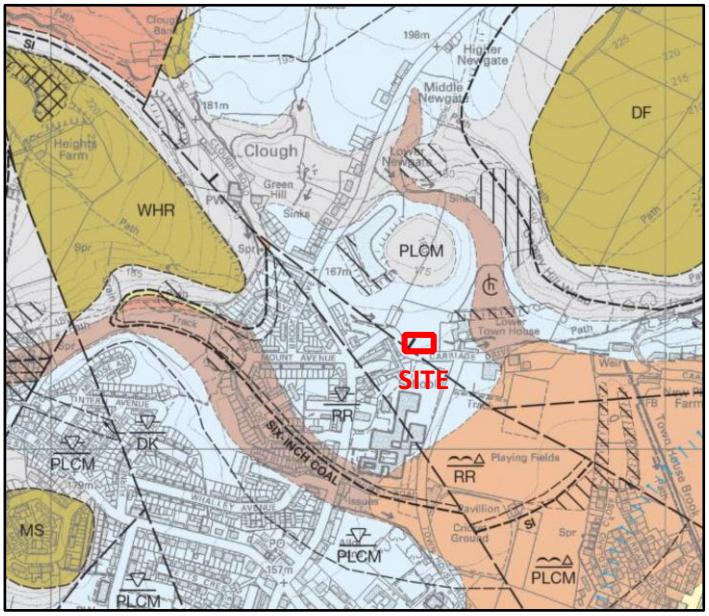
Site Block Plan Scale 1:200

NOTE
Red line indicates Land Area of Happy Hide-a-way

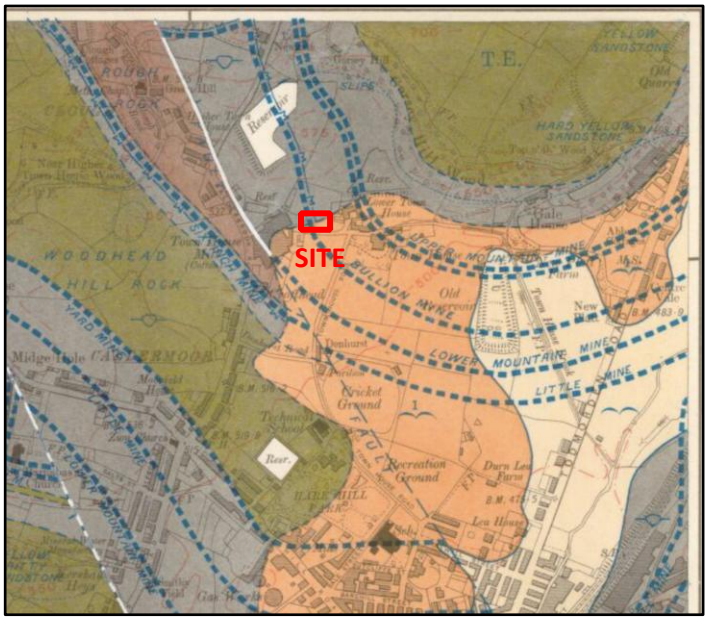
PLANNING DRAWING

Project:	**Happy Hideaway** Townhouse Road, Littleborough OL15 9JX
Title:	Site Block Plan
Client:	Gemma Whamby
Drawn By:	WRS on 05/06/2026
Original Size:	A2 Project Number: 2026 / 01
Drawing Number:	02

APPENDIX D
GEOLOGY MAP EXTRACTS

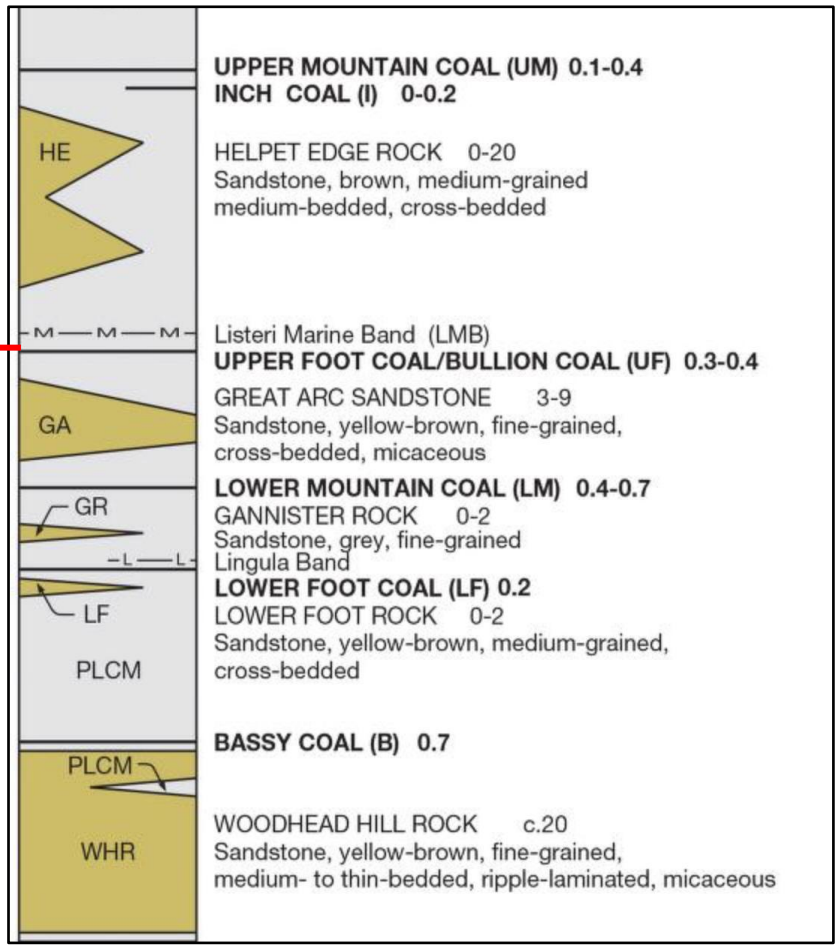


BGS 1:10,000 Solid and Drift geology map (Sheet SD91NW)



BGS 1:10,560 scale geological sheet dated 1925 (Lancashire 81 SW)

TENTATIVE SITE ELEVATION



UPPER MOUNTAIN COAL (UM) 0.1-0.4
INCH COAL (I) 0-0.2

HELPET EDGE ROCK 0-20
Sandstone, brown, medium-grained
medium-bedded, cross-bedded

Listeri Marine Band (LMB)
UPPER FOOT COAL/BULLION COAL (UF) 0.3-0.4

GREAT ARC SANDSTONE 3-9
Sandstone, yellow-brown, fine-grained,
cross-bedded, micaceous

LOWER MOUNTAIN COAL (LM) 0.4-0.7

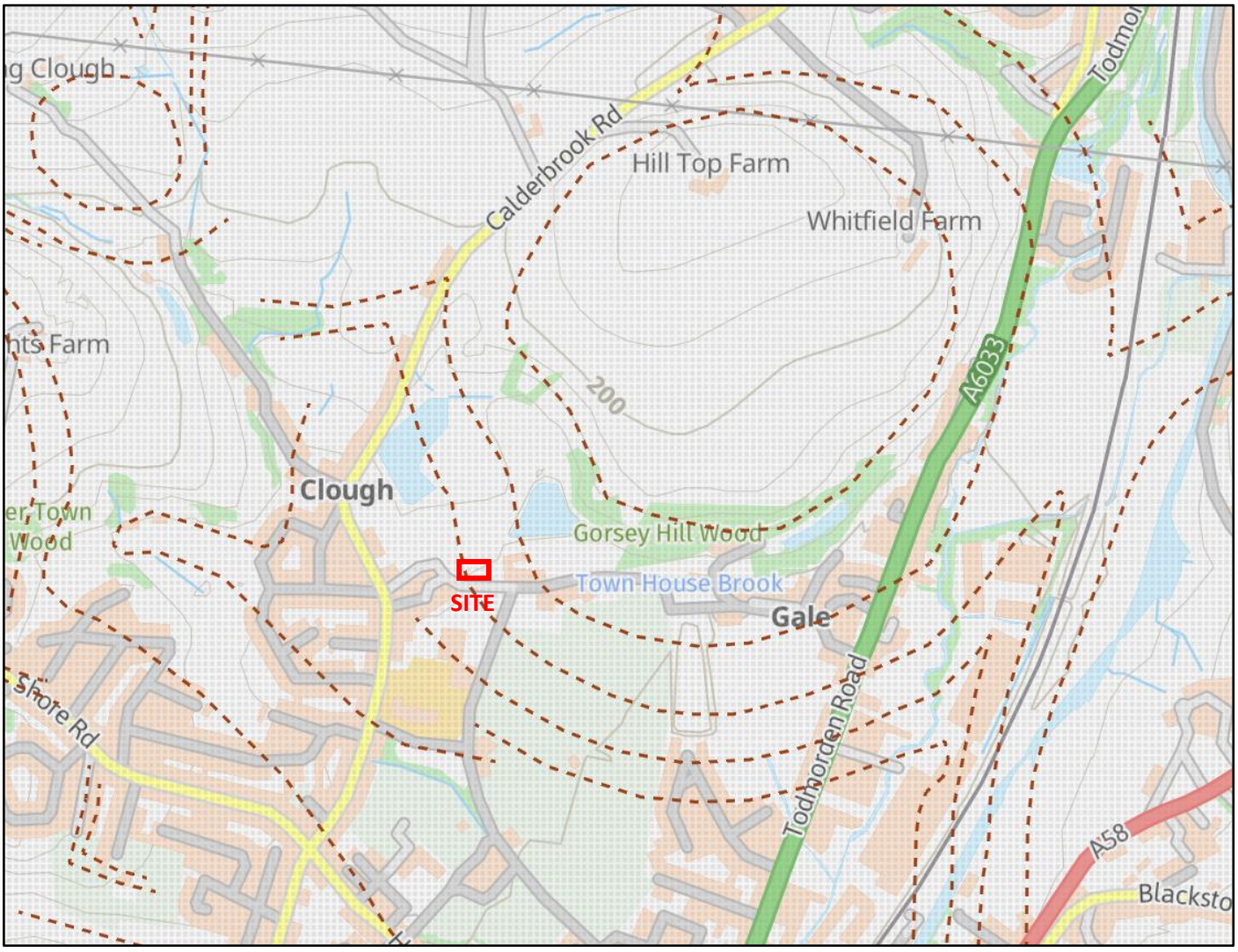
GANNISTER ROCK 0-2
Sandstone, grey, fine-grained
Lingula Band
LOWER FOOT COAL (LF) 0.2

LOWER FOOT ROCK 0-2
Sandstone, yellow-brown, medium-grained,
cross-bedded

BASSY COAL (B) 0.7

WOODHEAD HILL ROCK c.20
Sandstone, yellow-brown, fine-grained,
medium- to thin-bedded, ripple-laminated, micaceous

APPENDIX E
CA ONLINE INTERACTIVE MAPPING



APPENDIX F
BGS BOREHOLE RECORD

British Geological Survey

BGS ID: 34928 : BGS Reference: SD91NW120
British National Grid (27700) : 393730,417170

120.

SD91NW/
NGR: 93736 17170

Sampling					Strata		
Depth	Type	Casing Depth	Date/ Water	SPT N (Cu)	Description	Depth (Thickness)	Level
			01/07 1997		MADE GROUND: Very soft to soft grey-brown sandy clay with a little subangular to subrounded fine, medium to coarse gravel. Trace organics noted predominantly rootlets. (Bricks noted**)	G.L.	155.78
0.50	D					(0.90)	
1.00-1.45 1.00-1.50	C B	NIL	DRY	4	Medium dense grey brown silty very sandy subangular to rounded fine, medium to coarse GRAVEL, predominantly sandstone.	0.90	154.88
1.80 2.00-2.45 2.00 2.00-2.50	D C W B	1.50	DRY	13		(1.80)	
2.80 3.00-3.45 3.00-3.50	D U(55) D	3.00	DRY		Stiff grey slightly sandy silty CLAY with some angular to subrounded fine, medium to coarse gravel, predominantly sandstone and mudstone.	2.70	153.08
3.80 4.00-4.45	D U(53)	4.00	DRY		From 3.80m: brown mottled grey.	(1.80)	
4.50	D					4.50	151.28
4.80 5.00-5.45 5.00-5.50 5.00	D U(73)F B W	4.50	DRY		Stiff orange-brown slightly silty sandy CLAY with much angular to subrounded fine, medium to coarse gravel. (large sandstone cobbles noted**)	(0.50) 5.00	150.78
6.00-6.45 6.00-6.50	SD B	6.00	5.70	30	Dense grey-brown slightly silty very sandy angular to subrounded fine, medium to coarse GRAVEL. Cobble noted. Between 5.00m and 5.50m: sewage odour noted.	(1.50)	
7.00	D				Stiff to very stiff grey-brown slightly silty sandy CLAY with much subangular to rounded fine, medium to coarse gravel, predominantly sandstone and mudstone.	6.50	149.28
7.50-7.95 7.50-8.00	SD B	7.50	6.50	50	Between 7.50m and 8.00m: cobble noted.		
8.00		7.50	6.50		.....	8.00	147.78
					End of Borehole.		

Legend

Equipment: Cable Percussion Boring Rig (Dando 150)

Borehole Dia (mm): 150 to 8.00m
Casing Dia (mm): 150 to 7.50m

Groundwater

No.	Struck	Behaviour	Sealed
1	2.00	Rose to 1.80m in 20 mins 1.90/1.90 in 10/15 mins	2.80
2	5.00	Rose to 3.90m in 20 mins 4.50/4.60/4.20 in 5/10/15 mins	No

Ground Level 155.78 m OD

Drilled by PG
Logged by DKS
Checked by RP

Remarks
1. Permeability test carried out at 2.50m. Casing at 1.50m. Water level at 2.28m. (1½ hours)
2. Borehole terminated at 8.00m and backfilled with arisings.

See key sheet and appendices for explanations.

Form 1/0

Borehole Record

Exploration Associates

Project
River Roch Flood Alleviation Scheme
Environment Agency

Contract 127175

Borehole 57(1 of 1)

COMMERCIAL IN CONFIDENCE