

COAL MINING RISK ASSESSMENT

**PROPOSED RESIDENTIAL DEVELOPMENT
CALLIARDS MILL
SMITHY BRIDGE ROAD
LITTLEBOROUGH
ROCHDALE
OL15 8HP**

Author: Daniel Slattery
Client: Hallmark Developments Ltd
Doc Ref: rep-tjba-hallmark-oakenrod-CMRA-260224.docx

Revision	Date	Reason
0	Jul 2025	Original to support planning application.

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1 Introduction & Site Overview.

T. J. Booth Associates have been appointed by Hallmark Developments Ltd to compile a coal mining risk assessment (CMRA), to land at the rear of the former Calliards Mill in Smithy Bridge, Rochdale.

The proposal is for the construction of 8No residential dwellings, associated gardens, driveways and site access. It is located to the rear of the former mill building, in an area of general vegetation. The red line boundary of the site retains a 10m buffer to the River Roch.

This report will accompany the application and end ensure planning validation. Presently there are no planning conditions to discharge.

The purpose of the report is to assess the potential coal mining legacy local to the proposed residential development, and to put forward recommendations based on current best practice for approval by the LPA/Coal Authority.

2 Environmental Database Search.

2.1 Historic Maps.

Date	Notable features
1844	The nearest coal mining features are two separate coal pits in the Dearnley area 310m & 450m north. No other features noted within a 500m radius of the site.
1890s	The nearest features (old coal pit) is 180m southwest. There are also two circular features (disturbed ground, suspected shafts) on the map approximately 250m west. The Dearnley pits are no longer shown. No other features noted within a 500m radius of the site.
1910s	The only features is the disturbed ground from the two suspected shafts on the map 250m west. The old pit 180m southeast is no longer shown. The Dearnley pits are no longer shown. No other features noted within a 500m radius of the site.
1910s-1970s	The disturbed ground 250m west remained until built over with the new housing estate.

2.2 BGS Geology.

Superficial Geology:	The centre to east side of the site is underlain by alluvium - clay, silt, sand and gravel. The west side is underlain by Divensian till – diamicton.
Bedrock Geology:	The centre to east side of the site is underlain by the Pennine Lower Coal Measures Formation - mudstone, siltstone and sandstone. The west side is underlain by the Great Arc Sandstone.
Coal Entries:	There are numerous coal seams locally. There are 2No. seams beneath the western edge of the site which are the Upper Foot and Inch seams. There are also seams to the east/northeast of the site which are: • Lower Foot seam 50m northeast • Lower Mountain Mine 185m northeast.

2.3 BGS Borehole Records.

There is one relevant borehole found locally, which is on site and recorded as a former water well. The associated record is as follows:

Reference: SD91NW4

Name: JAS SCHOFIELD, CALLIARDS MILLS

Water Well Reference: SD91/3

0-100 ft	0-30.48 m	Quick sand
100-115 ft	30.48-35.05 m	Sand & gravel
115-152 ft	35.05-46.33 m	Black shale
152-162 ft	46.33-49.38 m	Gritstone
162-185 ft	49.38-56.24 m	Hard Blue shale
185-187ft	56.24-57.00 m	Cavity

2.4 TJBA Borehole Records 2019.

No records in the local area.

2.5 Mining Remediation Authority.

2.5.1 Consultant's Report (July 2025ddendum).

2.5.1.1 Mining activity & geology.

Past underground mining:	There are recorded workings beneath the Site as follows: Upper Mountain Mine (3X66) – depth 19m, dip 8.1 degrees south, extraction thickness 300mm. Lower Mountain Mine (3XAN) – depth 57m dip 8.1 degrees south, extraction thickness 600mm.
Probable unrecorded shallow workings:	Probable workings noted at shallow depth.
Spine roadways at shallow depth:	Not known to be a risk.
Mine entries:	One shaft noted reference No. 392415-005, at 392399 415460, treatment details unknown.
Abandoned mine plan catalogue numbers:	Abandoned mine references associated with the search boundary are as follows: 1882, 16820.
Outcrops:	Not known to be a risk.
Geological faults, fissures and breaklines:	Not known to be a risk.

2.5.1.2 Investigative or remedial activity.

Site investigations:	Not known to be a risk.
Remediated sites:	Not known to be a risk.
Coal mining subsidence:	Not known to be a risk.
Mine gas:	Not known to be a risk.
Mine water treatment schemes:	Not known to be a risk.

2.5.1.3 Licensing and future mining activity.

Future underground mining:	Not known to be a risk.
Coal mining licensing:	Not known to be a risk.

Court orders:	Not known to be a risk.
Section 46 notices:	Not known to be a risk.
Withdrawal of support notices:	Not known to be a risk.
Payments to owners of former copyhold land:	Not known to be a risk.

2.5.2 Online Interactive Map.

Past Recorded Underground Mining.	Past recorded underground mining is noted beneath the site as follows: There are recorded workings beneath the Site in seam 3XAN (Lower Mountain Mine). There are recorded workings beneath the area which just encroach onto the east site boundary related to seam 3X66 (Lower Mountain Mine). There aren't significant workings beneath the site associated with this seam.
Unrecorded Probable/Potential Shallow Underground Workings:	There are probable shallow workings which encroach on to the east part of the site.
Mine Shafts, Pits, Adits/Entries:	None within or close to the site boundaries.
Development High Risk Area:	There are Development High Risk Areas associated with the east side of the site.

3 Identification & Assessment of Site-Specific Coal Mining Risks.

Source Of Risk.	Comment.	Development Risk.	
Recorded Workings.	There are 'Development High Risk Areas' associated with past underground workings beneath the site and in the local area.	RISK NOTED IN COAL AUTHORITY DATA	FURTHER ASSESSMENT
Probable Shallow Workings.	There are 'probable' workings in the local area noted to encroach on the east of the site.	RISK NOTED IN COAL AUTHORITY DATA	FURTHER ASSESSMENT
Opencast Workings.	No past or future opencast workings noted locally.	LOW RISK	NO FURTHER ASSESSMENT
Coal Pits/Shfts/Adits.	No pits/shafts/adits noted within influencing distance of the Site.	LOW RISK	NO FURTHER ASSESSMENT
Mine Gas or subsidence.	No evidence of local events.	LOW RISK	NO FURTHER ASSESSMENT

4 Mitigation Strategy Proposed.

Although the Mining Remediation Authority plan and data show a potential risk to the site, there is a local borehole which indicates the risk is mitigated.

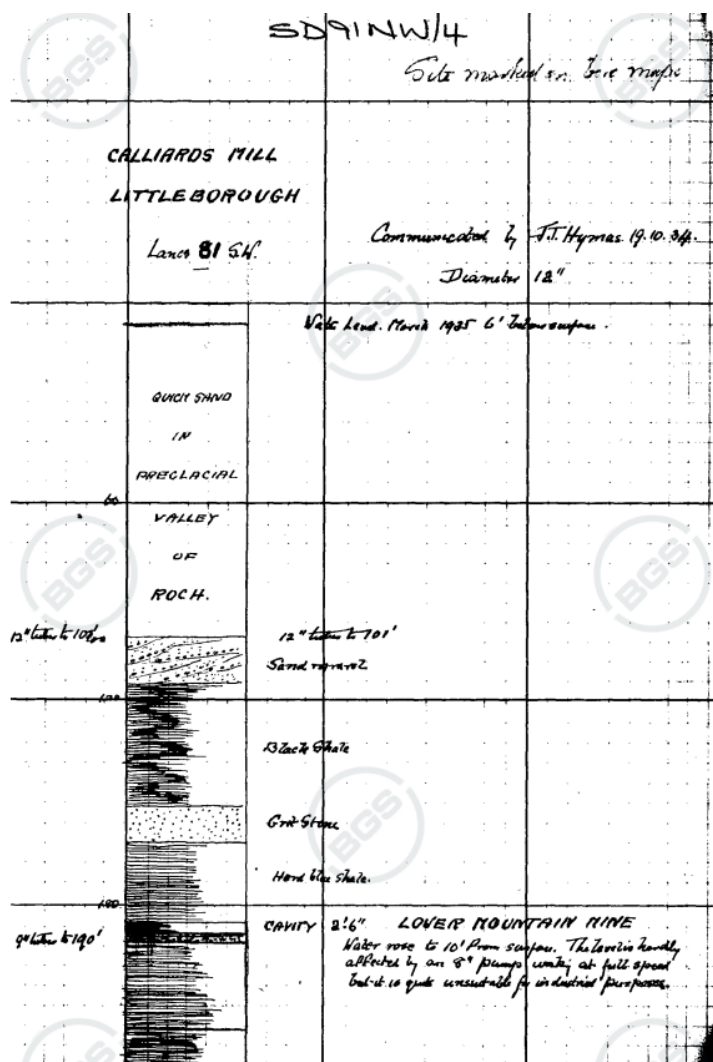
Coal seams on geological plans are inferred locally, and generally subcrop both to the northeast, and to the west of the site. The general dip of stratigraphy is to the southwest nominally 8 degrees (recorded), and so only seams that subcrop to the northeast underlie the site.

There is a historic water borehole and associated record logs to the centre southeast site boundary. The borehole records were noted as follows:

Water Well Reference: SD91/3

0-100 ft	0-30.48 m	Quick sand
100-115 ft	30.48-35.05 m	Sand & gravel
115-152 ft	35.05-46.33 m	Black shale
152-162 ft	46.33-49.38 m	Gritstone
162-185 ft	49.38-56.24 m	Hard Blue shale
185-187ft	56.24-57.00 m	Cavity (LOWER MOUNTAIN MINE)

See section below:



No other coal seams were noted within the stratigraphy apart from the Lower Mountain Mine coal seam, which has been worked beneath the site at a depth of c56m and has a worked cavity of around 760mm.

To further aid in risk assessment, Ciria C758 retains estimation of void migration as a means of mitigation.

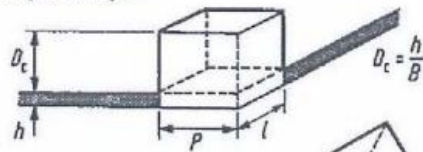
Figure 5.4 'Type and estimation of void migration', details potential type of void migration mechanisms from rectangular (best case) to conical (worst-case), and for certain rock types where bulking factors arrest the upward migration of voids. It particularly notes the bulking factors for typical ranges of Coal Measures (which are made up of both mudstone & sandstone), and the range thorough percentage of bulking factors from 30-50% (ie, more mudstone dominated to more sandstone dominated).

Given the Application Site is underlain by general undifferentiated Coal Measures, it can be assumed that as a conservative estimate, the Coal Measures have a bulking factor of 30%. Seam cavity working voids are recorded at 760mm.

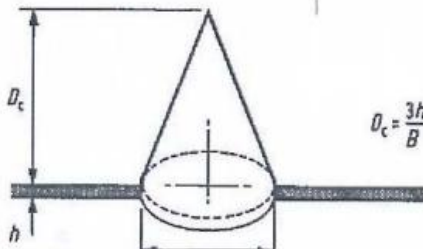
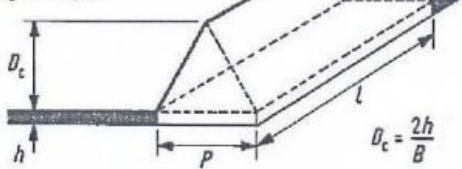
Given the above conservative parameters of 30% & a void space of 0.76m, the potential migration for a worst-case conical collapse can be given as:

$$\text{Conservative conical collapse} \quad D_c = 3h/B \quad = 3 \times 0.76 / 0.3 \quad = 7.6\text{m}$$

Rectangular collapse

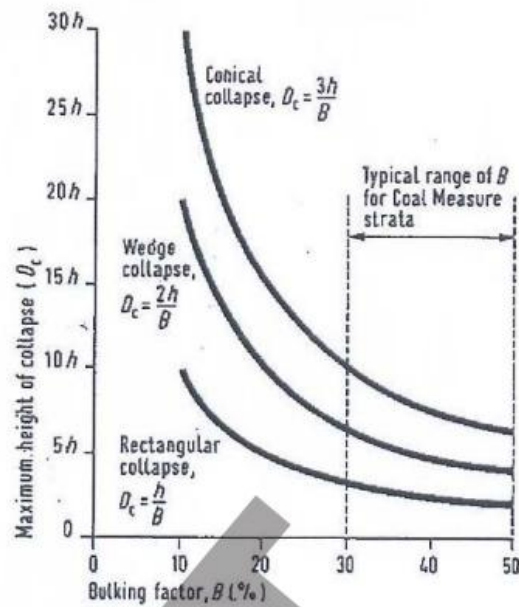


Wedge collapse



Conical collapse

(a) Diagram showing notation relating to maximum height of collapse and geometry



(b) Postulated variation in maximum height of collapse for different modes of failure and bulking factors

Even if the superficial deposits aren't considered, the depth of competent bedrock above the Lower Mountain Mine is 21.19m.

Considering the thickness of competent bedrock beneath the superficals, the worst case conservative conical collapse estimate of 7.6m would be arrested before it breaches the top of the bedrock, which indicates the Application Site will be safe from the potential effect of coal mining legacy.

There is also a gritstone cap rock noted above the workings, and additional 30m of superficial deposits which would mitigate the risk further.

Given the associated estimated cavity seam thicknesses >30m associated with the Application Site, the risk noted in section 3 (Identification & Assessment of Site-Specific Coal Mining Risks) is considered to be mitigated.

5 Conclusions & Recommendations.

Development at the Application Site is considered safe from coal mining legacy issues.

No further assessment or investigation is proposed.

This report should be approved by the Coal Authority prior to development.

Signed.....  .

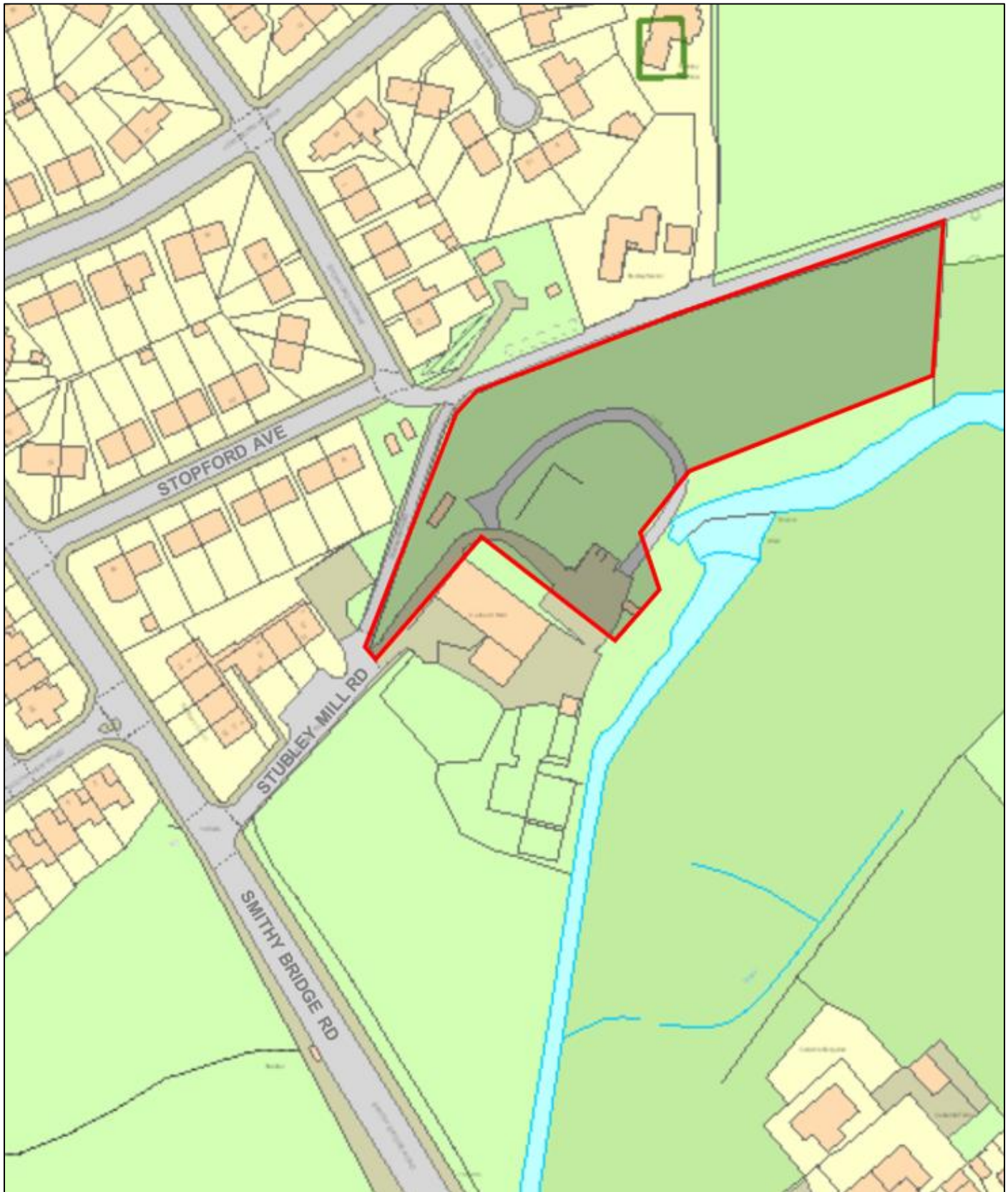
D.S. Slattery BSc (Hons).

T J Booth Associates.

Authorised...  .

T J Booth BSc (Hons), C. Eng. C. Env.

T J Booth Associates.

6 Appendix.**6.1 Location Plan.**

6.2 Proposed Plans.

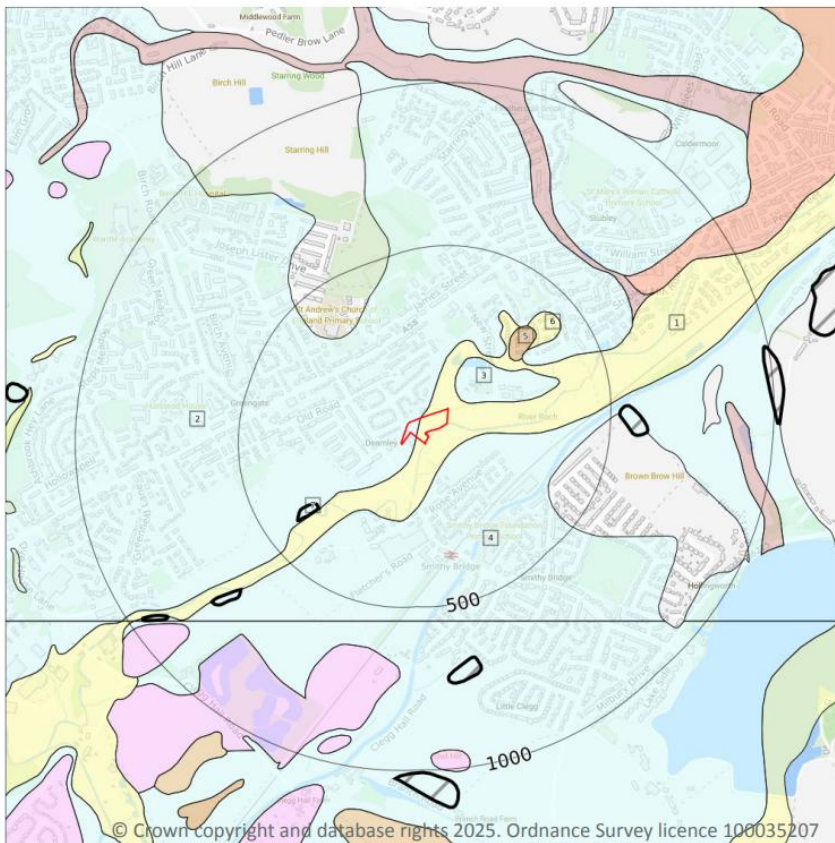
6.3 BGS Drift Geology.



CALLIARDS MILL, SMITHY BRIDGE
ROAD, LITTLEBOROUGH, ROCHDALE,
OL15 8HP

Ref: GS-YA1-URU-NLC-19G
Your ref: groundsure env & CA reps-hallmark-
calliards-070725
Grid ref: 392519 415599

Geology 1:10,000 scale - Superficial



— Site Outline
Search buffers in metres (m)
 Landslip (10k)
Superficial geology (10k)
Please see table for more details.

14.3 Superficial geology (10k)

Records within 500m

6

Superficial geological deposits at 1:10,000 scale. Also known as 'drift', these are the youngest geological deposits, formed during the Quaternary. They rest on older deposits or rocks referred to as bedrock.

Features are displayed on the Geology 1:10,000 scale - Superficial map on [page 101](#) >

ID	Location	LEX Code	Description	Rock description
1	On site	ALV-XCZSV	Alluvium - Clay, Silt, Sand And Gravel	Clay, Silt, Sand And Gravel
2	On site	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton
3	48m NE	TILLD-DMTN	Till, Devensian - Diamicton	Diamicton

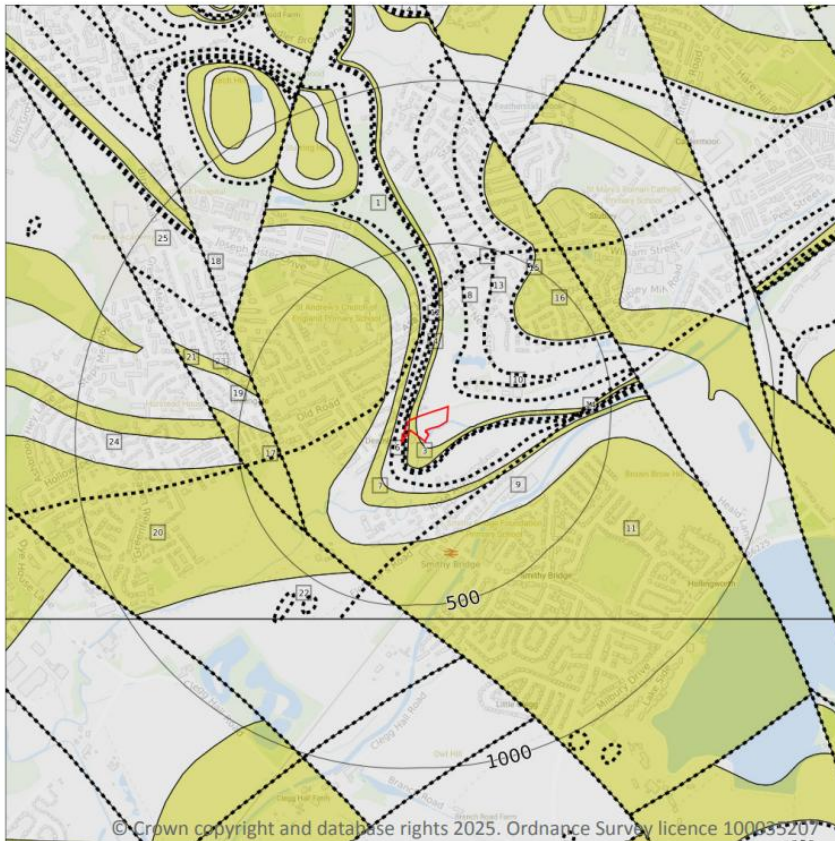
6.4 BGS Drift Geology.



CALLIARDS MILL, SMITHY BRIDGE
ROAD, LITTLEBOROUGH, ROCHDALE,
OL15 8HP

Ref: GS-YA1-URU-NLC-19G
Your ref: groundsure env & CA reps-hallmark-
calliards-070725
Grid ref: 392519 415599

Geology 1:10,000 scale - Bedrock



— Site Outline
Search buffers in metres (m)
---- Bedrock faults and other linear features (10k)
Bedrock geology (10k)
Please see table for more details.

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14.5 Bedrock geology (10k)

Records within 500m

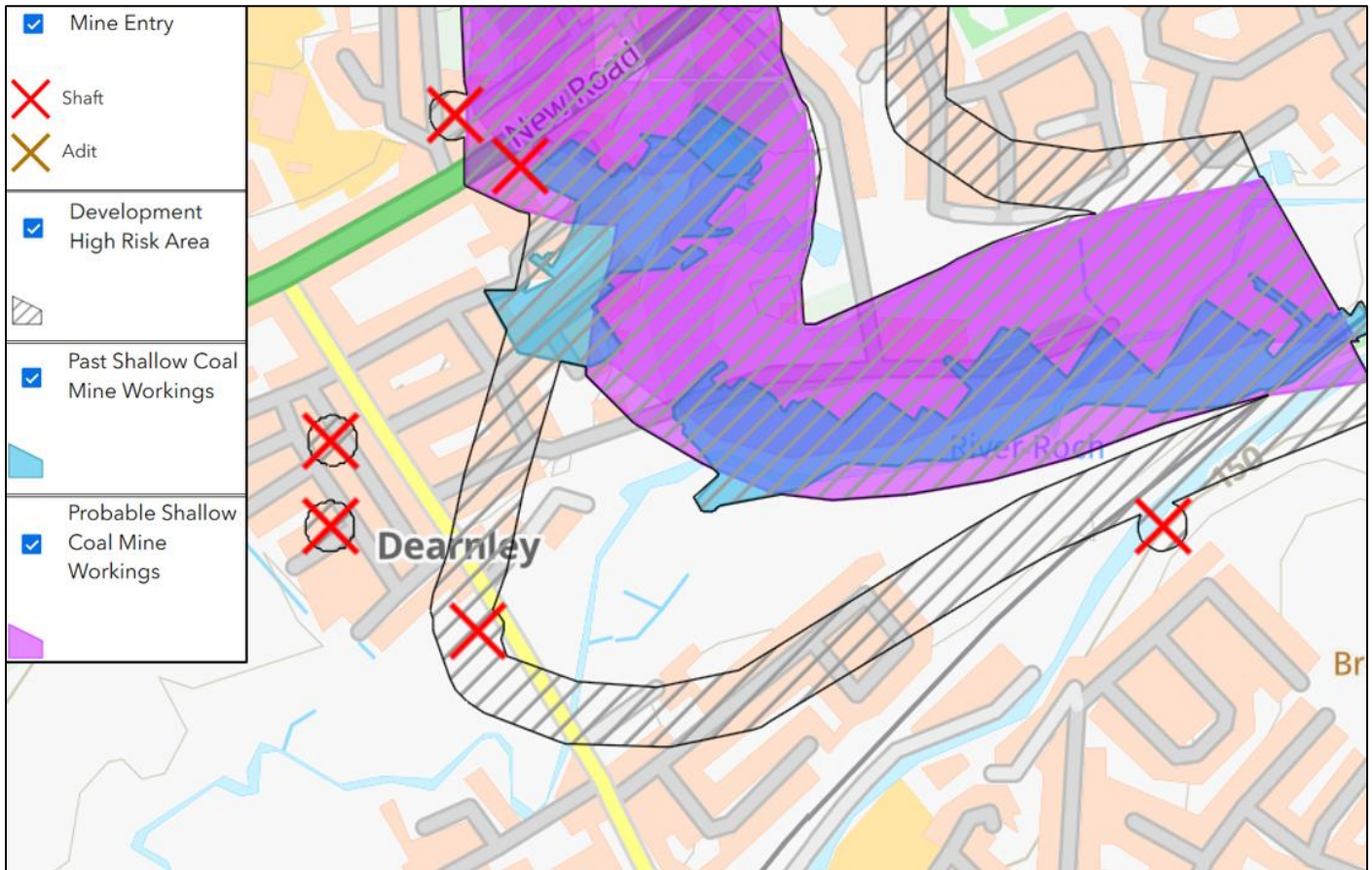
14

Bedrock geology at 1:10,000 scale. The main mass of rocks forming the Earth and present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

Features are displayed on the Geology 1:10,000 scale - Bedrock map on [page 103 >](#)

ID	Location	LEX Code	Description	Rock age
1	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
2	On site	PLCM-MDSS	Pennine Lower Coal Measures Formation - Mudstone, Siltstone And Sandstone	Langsettian Sub-age
3	On site	GAS-SDST	Great Arc Sandstone - Sandstone	Langsettian Sub-age

6.5 Coal Authority Interactive Map.



6.6 Coal Authority Report.



The Coal
Authority

Consultants Coal Mining Report

Calliards Mill, Smithy Bridge Road,
Littleborough, Rochdale
Greater Manchester
OL15 8HP

Date of enquiry: 7 July 2025
Date enquiry received: 7 July 2025
Issue date: 7 July 2025

Our reference: 51003510105001
Your reference: GS-63S-8YJ-U77-WBK



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

GROUNDSURE LIMITED

Enquiry address

Calliards Mill, Smithy Bridge Road, Littleborough,
Rochdale
Greater Manchester
OL15 8HP

How to contact us

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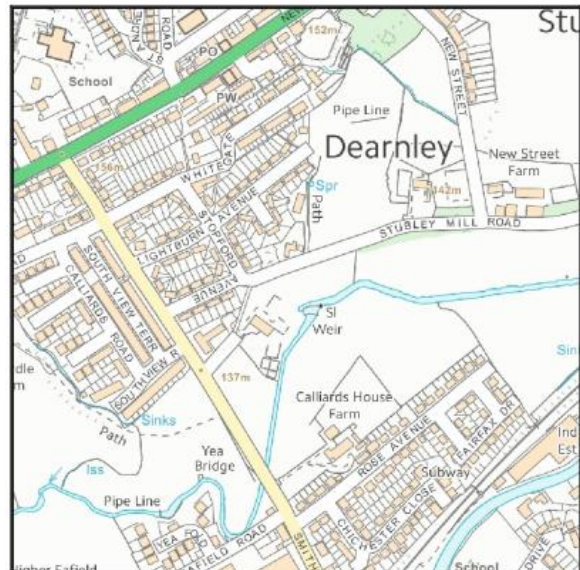
www.groundstability.com

 @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	UPPER MOUNTAIN	Coal	3X66	19	Beneath Property	8.1	South	30	1867
unnamed	LOWER MOUNTAIN	Coal	3XAN	57	Beneath Property	8.1	South	60	1886

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	392415-005	392399 415460	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:

1882	16820	
------	-------	--

Please contact us on 0345 762 6848 to determine the exact abandoned mine plans you require based on your needs.

Outcrops

No outcrops recorded.

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.

6.7 BGS Borehole Logs – SD91NW4.



British
Geological
Survey

BGS ID: 34812 : BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587

(*11932) W1.30370/0370 10,000 9/39 A&E.W.Ltd. Gp.685

Name and Number of Shaft or Bore given by Geological Survey:

SD 91 NW 4

County **LANCS** 12
6" Quarter Sheet **81SW**

GEOLOGICAL CLASSIFICATION	DESCRIPTION	THICKNESS	DEPTH
B781	Messrs. Jas. Schofield & Sons, Ltd. Calliards Miller Littleborough L		
	Bored By J.T. Hynes, 1934		
	Quick sand	100	100
	Sand & gravel	15	115
	Black shale	37	152
	Grit stone	10	162
	Hard blue shale	22 6	184 6
	Cavity	2 6	187
	On reaching cavity, water rose to 10', & even with an 8" pump working full speed the level is hardly affected.		
	ANALYSIS		
	Total hardness	21.0° Clark	
	Temp. "	11.0° "	
	Perm. "	10.0° "	
	Organic & volatile matter	1.0	
	Mineral matter	30.0	
	Lime carbonate	11.0	
	" sulphate	None	
	" nitrate	None	
	Magnesium carbonate	None	
	" sulphate	7.10	
	Sodium chloride	1.65	
	" sulphate, etc.	12.15	
	" carbonate	None	
	Iron & alumina oxides	0.60	
	Silica	0.50	
	For little purpose such as filling, storing of goods, etc. this water is quite suitable. For seaming operations it is rather hard. On Boils it would produce a hard scale Richardson & Jaffer 13.11.34		
	This water, being unavailable, was tubed out and b.h. deepened to <u>277'</u>		

SD 91 NW 4
County
6" Quarter Sheet

THICKNESS	DEPTH
Thickness	Depth
metric	metric
30 48	30 48
4 57	35 05
11 28	46 33
3 05	49 38
6 86	56 24
0 76	57 00



British
Geological
Survey

BGS ID: 34812 : BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587

(*11932) Wt.30370/0370 10,000 9/30 A & E.W.Ltd, Gp.685

Name and Number of Shaft or Bore given by Geological Survey:

SD91NW4

County

6" Quarter Sheet

2

GEOLOGICAL CLASSIFICATION	DESCRIPTION	THICKNESS	DEPTH
5/78	Deepening of b.h. at Calliards Mill By J.T. Hyman, 1935.		
	Already bored	187 -	187 -
	Hard Portland formation	1 -	188 -
	Hard gritstone	2 -	190 -
	Hard black shale	76 -	266 -
	Hard gritstone	11 -	277 -
	Water struck at 275'; rises to 12" a.s. 12" tube to 101', 9" to 190'. Yield on seven-days' test: 3,500 g.p.r.		
	<u>ANALYSIS.</u>		
	Total solids	14.00	grs / gallon
	Organic + volatile matter	1.00	"
	Mineral matter	13.00	"
	Loss on ignition	5.00	"
	" sulphate	None	"
	" nitrate	None	"
	Magn. carbonate	2.25	"
	" sulphate	None	"
	Sodium sulphate	0.22	"
	" chloride	1.32	"
	" carbonate	2.18	"
	Silica + alumina oxides	1.00	"
	Silica	1.00	"
		13.00	"
	Total hardness	8.00	Clark
	Temp.	5.80	"
	Pressure	2.20	"
	pH. 6.9		
	This water is quite suitable without treatment for domestic purposes such as drinking, fire-fighting or steam-raising. It can also be used as a boiler feed water with the production of a soft scale in the course of time. As it will be fairly of a sludgy nature it will be able to be blown off by the sludge & sump cock. (Signed) Richardson & Jaffe Jan. 25, 1935.		
	Used only as an emergency supply now. Visited and cited on March 8/56. O.D. 4.35' M.H.P. 24.4.56.		

SD91NW4	Meas.
57 00	57 00
0 30	57 30
0 61	57 91
23 17	81 08
3 35	84 43



British
Geological
Survey

BGS ID: 34812 : BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587

SD91NW. 4

THE DISTRICT GEOLOGIST.

(2)

19/10/34.

16
2
81 SW

CALLIARDS MILL, LITTLEBOROUGH.

Section of Borehole

	Ft	ins	Ft	ins
Quick Sand	100	0		
Sand & Gravel	15	0	115	0
Black Shale	37	0	152	0
Grit Stone	10	0	162	0
Hard Blue Shale	22	6	184	6
Cavity	2	6	187	0

Drawn up. Section in File.



British
Geological
Survey

BGS ID: 34812 : BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587

High
Slack
Quarry
to the west
Near Bank
clay

SD 81 NE 91 NW

Reddyshaw or Reddyshore Clay Mines

Summit, Littleborough.

Worked by Messrs John Tetlow & Sons, Limited. 1899.

Home Office Plan 3989

1" map new series - (Rochdale) 76

Not to
be used
as a
guide

Section CD on map: — 25' up 81.7. NW Lancashire.
Levels shown in green.

- | | |
|-------------------|--------|
| 6. shale | |
| 5. Coal | 6" |
| 4. Upper Fireclay | 3' 1" |
| 3. Clay | 9' 6" |
| 2. Coal | 1' 0" |
| 1. Lower Fireclay | 3' 10" |



British
Geological
Survey

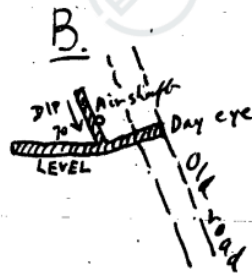
BGS ID: 34812 : BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587

? SD 91NW 4 50 81NE

Second working shown on field slip Lancashire 81NE.W.
of B (in green ink). Section here:-

3. Dark shale	2'
2. Coal	3"
1. Fireclay	3'2"

Plan (enlarged) on a scale of 22 yards to one inch.

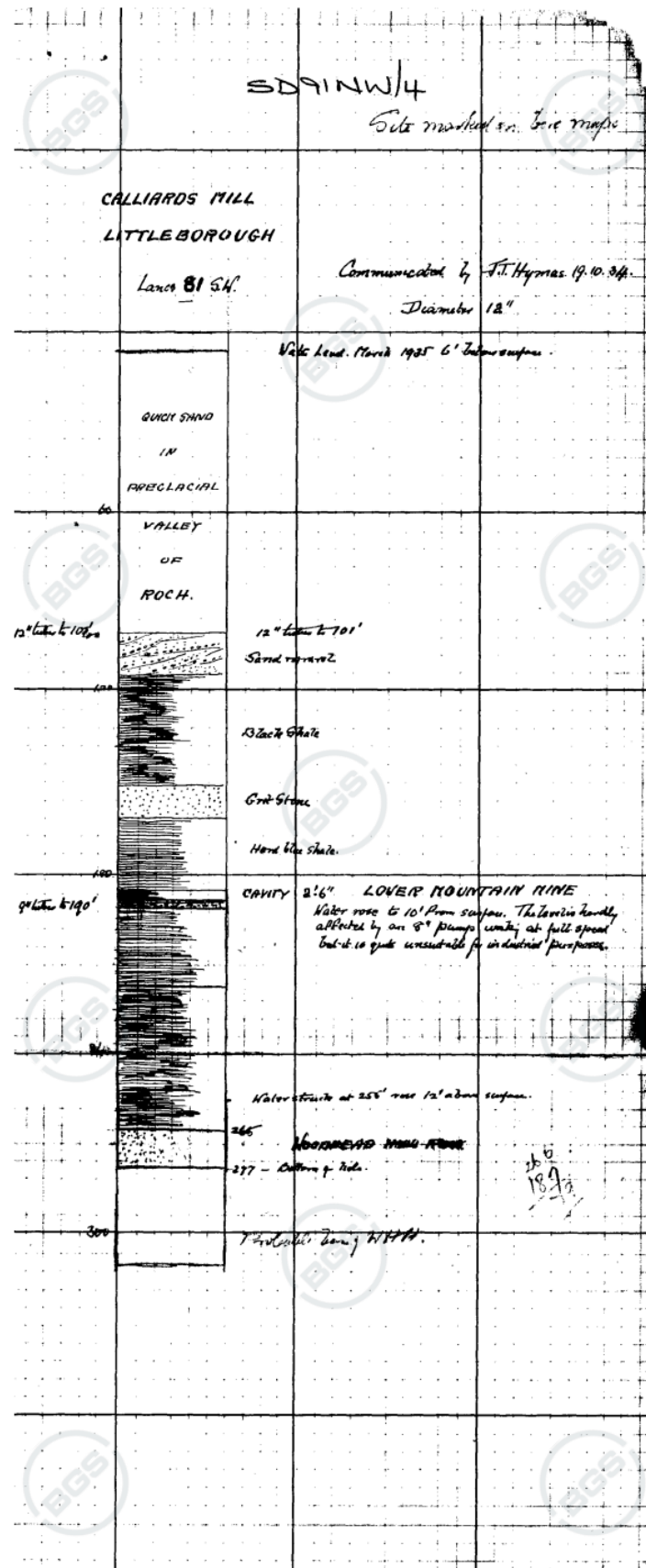


of 1" map.



British
Geological
Survey

BGS ID: 34812; BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587





British
Geological
Survey

BGS ID: 34812 : BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587

SD91/3 77

(*11988) W1.30370.0370 10,000 9/39 A.E.W.L.A. Gp.485

Name and Number of Shaft or Bore given by Geological Survey: **1"76.**

County **LANCS**
6" Quarter Sheet **81SW**

GEOLOGICAL CLASSIFICATION	DESCRIPTION	THICKNESS	DEPTH
B781	Messrs. Jas. Schofield & Sons, Ltd. Callendar Mills Littleborough		
	Bored by J.T. Hyatt, 1934 EC Coy 10/3/34 + 15/3/35		
	Quick sand	100	
	Sand & gravel	15	115
	Black shale	37	152
	Grit stone	10	162
	Hard blue shale	22 6	184 6
	Cavity	2 6	187
	On reaching cavity, water rose to 10', & even with an 8" pump working full speed the level is hardly affected.		
	ANALYSIS		
	Total hardness	21	0° Clarke
	Temp.	11	0°
	Perm.	10	0°
	Organic & volatile matter	1	0
	Mineral matter	30	0
	lime carbonate	11	0
	" sulphate	None	
	" nitrate	None	
	Magnesium carbonate	None	
	" sulphate	7	10
	Sodium chloride	1	65
	" sulphate, etc.	12	15
	" carbonate	None	
	Iron & alumina oxides	0	60
	Silica	0	4
	For testing purposes small amount of sludge, etc. the water is quite suitable. For steaming operations it is rather hard. On Boilers it would produce a hard scale.		
	Richardson & Jaffer 13.12.34		
	This water, being unsuitable, was turned off and the pump changed to 277		
	Inf from WB letter dtd 12/11/36.		
	(1) Pumping ceased Nov 55 owing to accident to pumping gear. (2) Pumps dismantled & sold for demolition. (3) All plant transferred to Buckley Mills.		



British
Geological
Survey

BGS ID: 34812 : BGS Reference: SD91NW4
British National Grid (27700) : 392522,415587

SD91NW/4

SD9254 1560

THE DISTRICT GEOLOGIST.

(2)

19/10/34.

SD91/3
70/72
81 SW

CALLIARDS MILL, LITTLEBOROUGH.

Section of Borehole

	Ft	ins	Ft	ins
Quick Sand	100	0		
Sand & Gravel	15	0	115	0
Black Shale	37	0	152	0
Grit Stone	10	0	162	0
Hard Blue Shale	22	6	184	6
Cavity	2	6	187	0

Drawn up Section in File