

REF: 2165/BGR/Replete/mjs

Dafydd Edwards
Senior Architectural Technician
Blueprint Architectural Services
Office 3K4
Redwither Tower
Redwither Business Park
Wrexham LL13 9XT

11th December 2018

Dear Dafydd,

RE: BRYN GLAS RHOS: MINING STUDY

1.0 Introduction

It is proposed to develop a site in Bryn Glas in Rhos, Wrexham. This will involve demolition of the existing bungalow on site, which will be replaced with three new houses.

However, the Local Authority Planning Department have requested further information on the risk of shallow mining at the site.

Blueprint Architectural Services (BAS) are the architects for the scheme and they have appointed GroundSolve Ltd on behalf of the client to investigate the mining risk at the site and give recommendations on what investigation/remedial measures need to be undertaken.

This investigation was limited to a desk study, which included the following research;

- Coal Consultants report,
- Site walkover,
- BGS Boreholes,
- Wrexham applied Mapping study,
- Mine plans held in GSL archives,
- Old historical plans in GSL archives,
- Geology plans and memoirs.

This letter report presents the findings of the desk study research, discusses the risks posed by shallow abandoned mineworkings and gives recommendations for the way forward.

2.0 Site Location and Description

The site is located at 57 Bryn Glas, Rhos, in Wrexham at National Grid Reference SJ 289 459. At present the site is occupied an existing brick bungalow, see current site layout below.

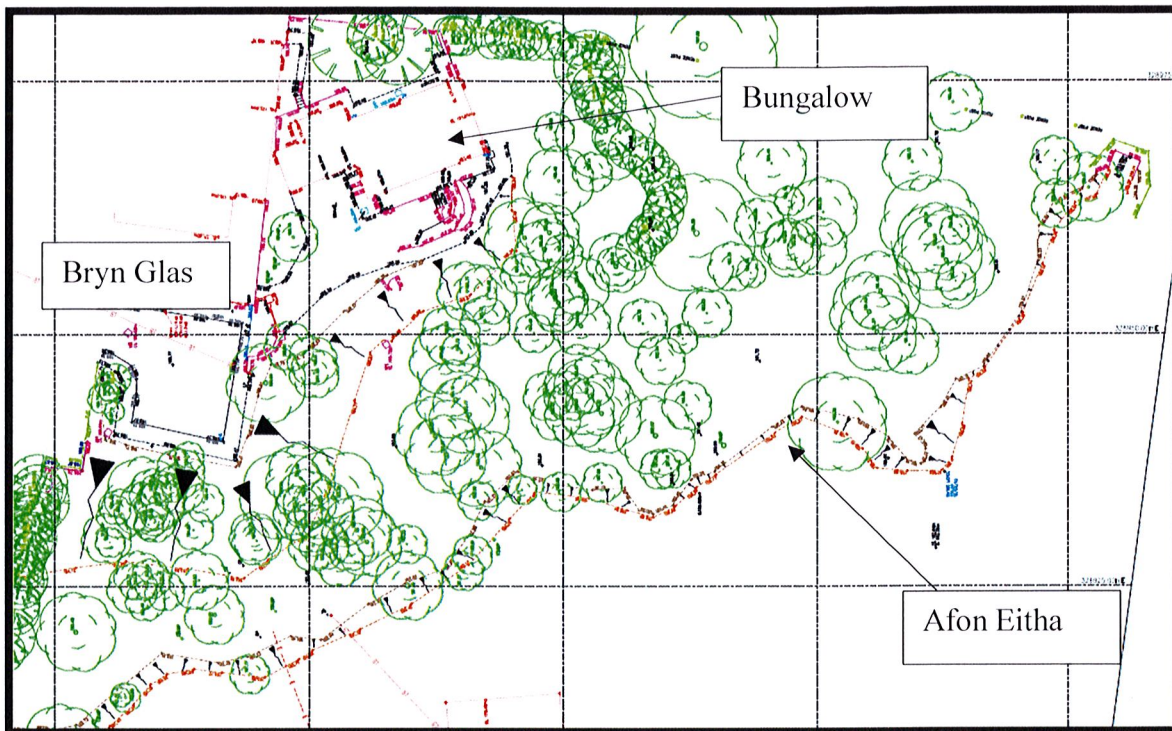


Figure 1 Current Site Layout

The site is bounded by housing and Bryn Glas to the north, a footpath along the line of a disused railway to the east, and a stream known as the Afon Eitha to the west. The area between the existing house and the stream is heavily wooded.

A topographical survey provided by the client revealed the existing floor slab elevation to be 167mAOD. The ground levels reducing to around 158mAOD on the southern site boundary adjacent to the Afon Eitha.

To the west of the existing house the ground level drops quite steeply, and it appears this section of the site has been filled, as the general slope towards the Afon Eitha is quite gentle.

Photographs of the site are presented in Appendix A.

3.0 Geology

The geology of the site has been studied on the following sources:

- 1:50,000 scale geology plan, Sheet 121 Wrexham,
- Historical geology plans at a scale of 1:10,560,
- Wrexham study at a scale of 1:25,000,
- Geological memoirs.

The Wrexham study shows the Red coal seam outcropping immediately west of the site, which is then underlain by the Fireclay Group.

The 1977 geology plan at a scale of 1:10,560 shows the Red seam outcropping to the east of the site, along the railway line, with the Fireclay Group outcropping immediately downslope of the site.

The memoirs record the following sequence in descending order:

- Red Coal,
- Stone Coal,
- Fireclay,
- Half Yard Coal,
- Fireclay,
- Firedamp Coal

The separation given between the Red Coal and the Firedamp Coal is only 15m.

4.0 Mining

A Coal Consultants report has been obtained from the Coal Authority, the findings are summarised below, and presented in full in Appendix B.

- The site has been undermined in the Ruabon Yard (Soft five quarters) coal at an estimated depth of 17m.
- The seam thickness was 1.0m and dipped at 6° in an easterly direction,
- The seam below this was at a depth of 54m,
- It concluded that there are probably unrecorded mine workings beneath the site,
- A shaft is shown on the site beneath the northern section of the existing building,
- No treatment details are known for the shaft,
- The outcrop of the Stone Coal seam is shown outcropping immediately west of the site and would be anticipated to be at shallow depth beneath the site.

A sequence from the engine pit of Afon Eitha Colliery, which was just to the south of the site is presented below.

This shows the Red Seam underlain by three rows of ironstone, the New Coal (Stone), Half Yard Coal and the Firedamp Coal and their fireclays.

Seams at greater depth beneath these include the Nant, Yard, Wall and Bench and the Llwyn Ennion.

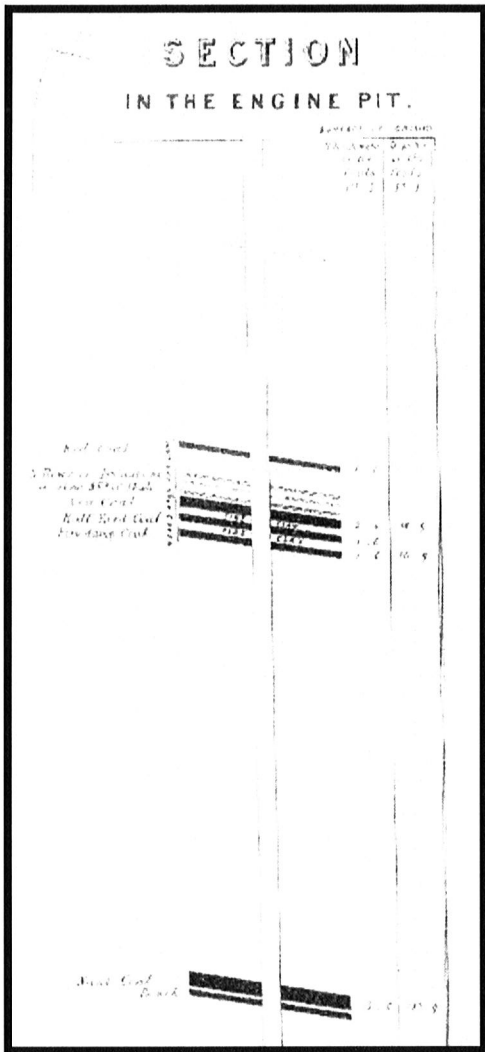


Figure 2 Showing Geological Sequence beneath the site

Mine plans held by GSL show workings from the Rhos Farm Colliery, which was immediately west of the site in the Yard Coal dated 1850, which were pursued by total extraction methods. In addition, the Wall and Bench coal was worked. However, the workings were shown to the west of the site itself.

No records of workings in the Fireclay sequence were recorded.

5.0 History

The history of the site has been studied on old Ordnance Survey (OS) plans dating from 1874 through to the present day.

An OS plan dated 1874 shows there to be an active coal shaft immediately west of the site, probably associated with Rhos Farm Colliery, with a disused shaft to the east of the site. The railway had been constructed on the eastern site boundary.

No other changes were noted relating to mining and the current house had been constructed by the 1976 OS plan.

6.0 Previous Investigation

A borehole found on the BGS website drilled around 100m south of the site proved some 65' (19.80m) of sand and gravel, with 35' (10.67m) of shale proved beneath the sand and gravel, giving a total depth of 100' (30.50m). A total of eight boreholes were drilled with no workings being encountered.

The borehole location and log are presented in Appendix C.

7.0 Proposed Development

The proposed development will comprise three new properties and associated drains and access roads. The proposed development layout is presented below on Figure 3.

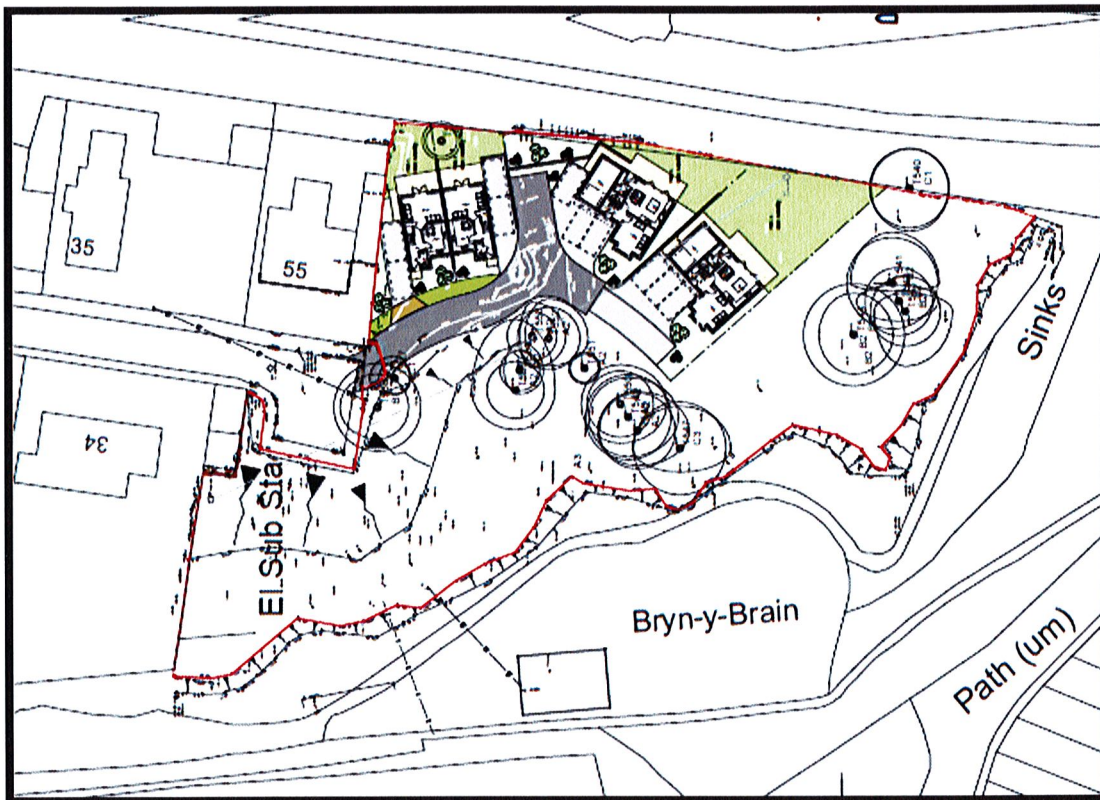


Figure 3 Proposed Development Layout

8.0 Discussion and Conclusions

Shaft

The site walkover failed to reveal any evidence of the shaft, although, the presence of made ground in this area does suggest a shaft may be present.

However, the shaft was not present on the 1874 OS plan and no mound of spoil was presented at its location, which was standard for all of the disused shafts in this area. Consequently, it may have been a trial shaft, especially as a large mound of spoil was not present.

In addition, since the shaft pre-dates 1874, the source information for this shaft would have been poor, and the plotting of the shaft would not have been carried out to any degree of accuracy. Experience in this area shows that shafts can be up to 50m from their recorded positions.

At the time of the possible workings, it would have been standard practice to sink the shaft and then work the coal up dip to ensure that the workings would drain by gravity, as pumping capacity at the time would have been limited. It is therefore considered highly unlikely that this shaft worked the shallow seams, as the dip would have meant working the seam at shallow depth beneath the Afon Eitha, with the inherent risks this would have entailed.

In conclusion, whilst there is a possibility that the shaft is not present on site, or is a trial shaft, the fact that it is on the Coal Authority records means that it will be necessary to search for the shaft to prove its existence. This should be undertaken following demolition of the existing building, either by drilling or excavation with a tracked excavator.

Shallow Abandoned Mine Workings

The borehole drilled immediately south of the Afon Eitha is roughly along the strike of the bedrock, which dips gently in an easterly direction. Consequently, similar ground conditions would be anticipated beneath the site as in BH 1, see Appendix C.

The borehole elevation is shown as 147.8, with a question mark attached. However, examination of the Ordnance Survey plans showed the 165m contour passing through the site with the land falling to the south west. The 160m contour passes to the south of the Afon Eitha in the approximate position of BH 1, which proved 19.80m of sand and gravel, with 10.67m of shale proved beneath the sand and gravel, giving a total depth of 30.50m. It is therefore likely that a site datum was used for the previous boreholes.

A total of eight boreholes were drilled in the previous investigation, with no workings being encountered. The other boreholes in this investigation proved between 12.2 to 24.7m of superficial deposits. In addition, these boreholes were drilled up dip of the sequence anticipated beneath the site, meaning that any coal seams would be anticipated to get shallower in a westerly direction. BH 8 the most westerly borehole drilled some 200m west of the site did not encounter any coal or workings by a depth of 30m, with 18.28m of rock proved. Therefore, given a dip of 6° in an easterly direction the strata at the base of BH 8 would be at a depth of 50m.

If the superficial deposits beneath the site are as thick as suggested by the boreholes, it is considered unlikely that the recorded seams actually outcrop beneath the site, and if present would have been highly weathered and unlikely to be worked. In addition, the Red seam has not got a reputation for being worked.

In conclusion, if the superficial deposits are as thick as suggested by the nearby boreholes then it is considered unlikely that the underlying coals and their associated fireclays have been worked. If this is the case the seams beneath fireclay sequence would be at considerable depth and would not present any risk to the development.

However, it will be necessary to prove the negative and drill boreholes to prove the sequence beneath the site. These should be rotary percussive boreholes that will penetrate the superficial deposits and then drill the rock to prove the seam depths.

We trust this is satisfactory, should you have any queries please call Mike Scott on 01244 661361.

Yours sincerely



Mike Scott

APPENDIX A

Site Photographs



Photograph 1 Existing Bungalow



Photograph 2 Rear of Bungalow

APPENDIX B

Coal Consultants Report



The Coal
Authority

Consultants Coal Mining Report

Nantcol
57 Bryn Glas
Rhosllanerchrugog
Wrexham
LL14 2EA

Date of enquiry:	13 November 2018
Date enquiry received:	13 November 2018
Issue date:	13 November 2018

Our reference:	51001967635001
Your reference:	2165/mjs



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

GROUNDSOLVE LTD

Enquiry address

Nantcol
57 Bryn Glas
Rhosllanerchrugog
Wrexham
LL14 2EA

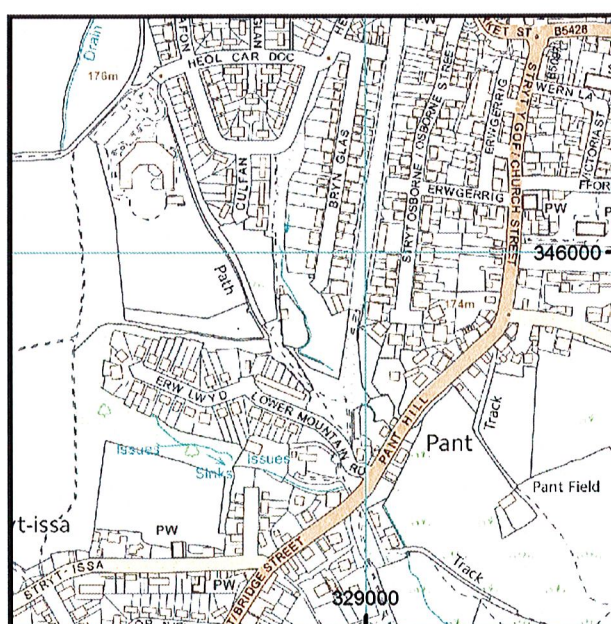
How to contact us

0345 762 6848 (UK)
+44 (0)1623 637 000 (International)

200 Lichfield Lane
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	RUABON YARD (SOFT 5 QTRS)	Coal	382J	17	Beneath Property	6.0	East	100	1872
unnamed	RUABON YARD (SOFT 5 QTRS)	Coal	7BNU	54	Beneath Property	6.0	East	100	1862
unnamed	HALF YARD / QUEEN	Coal	381B	66	North-West	7.0	East	50	1868
unnamed	WALL AND BENCH	Coal	7H24	68	South-West	6.0	East	110	1850
unnamed	WALL AND BENCH	Coal	7H2Q	72	West	6.0	East	110	1860

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	328345-087	328910 345937		Coal	
Shaft	328345-174	328879 345920		Coal	
Shaft	328345-175	328901 345865	This entry was grouted and plugged in 1981 by NKC Geotech to an unknown specification.	Coal	
Shaft	328345-177	328939 345806	This entry has been grouted and plugged in 1981 by NKC Geotech Ltd. The specification for these treatments is unknown.	Coal	
Shaft	328345-300	328969 345949		Coal	
Shaft	329345-200	329039 345957		Coal	
Shaft	329345-301	329018 345939		Coal	
Shaft	329345-303	329065 345858		Coal	
Shaft	329345-480	329071 345959		Coal	

Abandoned mine plan catalogue numbers

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

R289	NW1508	14896
14880	14889	0
14897	PO0	NW1507

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
STONE	Coal	Yes	Within	N/A	8

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

Please refer to the "Summary of findings" map (on separate sheet) for details of any opencast areas 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.

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.

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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VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	13 November 2018
Issued to	GROUNDSOLVE LTD WELL HOUSE BARNS CHESTER ROAD BROUGHTON FLINTSHIRE CH4 0DH
Property search for	NANTCOL 57 BRYN GLAS RHOSLLANERCHRUGOG WREXHAM LL14 2EA
Reference number	51001967635001
Date of issue	13 November 2018
Cost	£106.79
VAT @ 20%	£21.36
Total received	£128.15
VAT registration	598 5850 68

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

APPENDIX C

Previous Investigation

Pen-y-cae Site 'C'. Report on Boreholes drilled in July
and August 1973. With plan and sections.

1. A previous report, dated 2nd. June 1973, stated that several boreholes would be necessary on this site to prove if any very shallow workings existed.

Eight holes have been drilled, in the positions shown on the accompanying plan, numbered 1257, and sections of the holes are shown on plans numbered 1268, 1269 and 1270. Holes numbered 2, 3, 5, and 7 started in normal soil, while those numbered 1, 4, 6 and 8 started in made ground. No. 1 was in ashes to a depth of 2 feet six inches, probably part of the old railway embankments; No. 4 was in shale fill to depth of five feet six inches and No. 6 was in shale and coal fill to a depth of eight feet. No. 8 consisted of shale and brick fill to a depth of five feet, probably waste from the adjoining Pant Brickworks.

Brown Sandy Clay was then proved in all holes, with a thickness varying from four feet to seven feet six inches, followed by sand and gravel in the holes numbered 1, 2, 3 and 6, with a thickness of from nine feet to thirty six feet. Holes 4, 7 and 8 had clay and gravel instead, with a thickness of nineteen feet to thirty two feet six inches while hole No. 6 had thirty seven feet of Boulder Clay and gravel and No. 5 had sixty seven feet of Boulder Clay.

Boulder Clay appeared in all the holes except Nos. 7 and 8, which had Clay and Gravel, followed by Sand and Gravel.

A rather plastic clay was proved in Nos. 3, 4 and 6, its thickness being eleven feet to twelve feet.

Finally, all holes passed into shale which persisted to their full depths, as follows -

No. 1	from 65' 0"	to 100' 0"	=	35' 0"
2	76' 0"	120' 0"	=	44' 0"
3	70' 0"	100' 0"	=	30' 0"
4	81' 0"	120' 0"	=	39' 0"
5	74' 0"	120' 0"	=	46' 0"
6	64' 5"	110' 0"	=	45' 7"
7	50' 0"	100' 0"	=	50' 0"
8	40' 0"	100' 0"	=	60' 0"

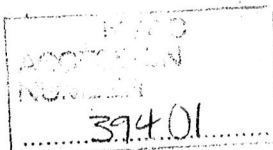
2. No old workings were proved in any of the holes and only one trace of coal (2") in No. 6 Borehole. It is possible that the shale proved in all the holes is that which overlies the Nant Seam and the trace of coal in No. 6 borehole could be a trace of the Firedamp Seam.

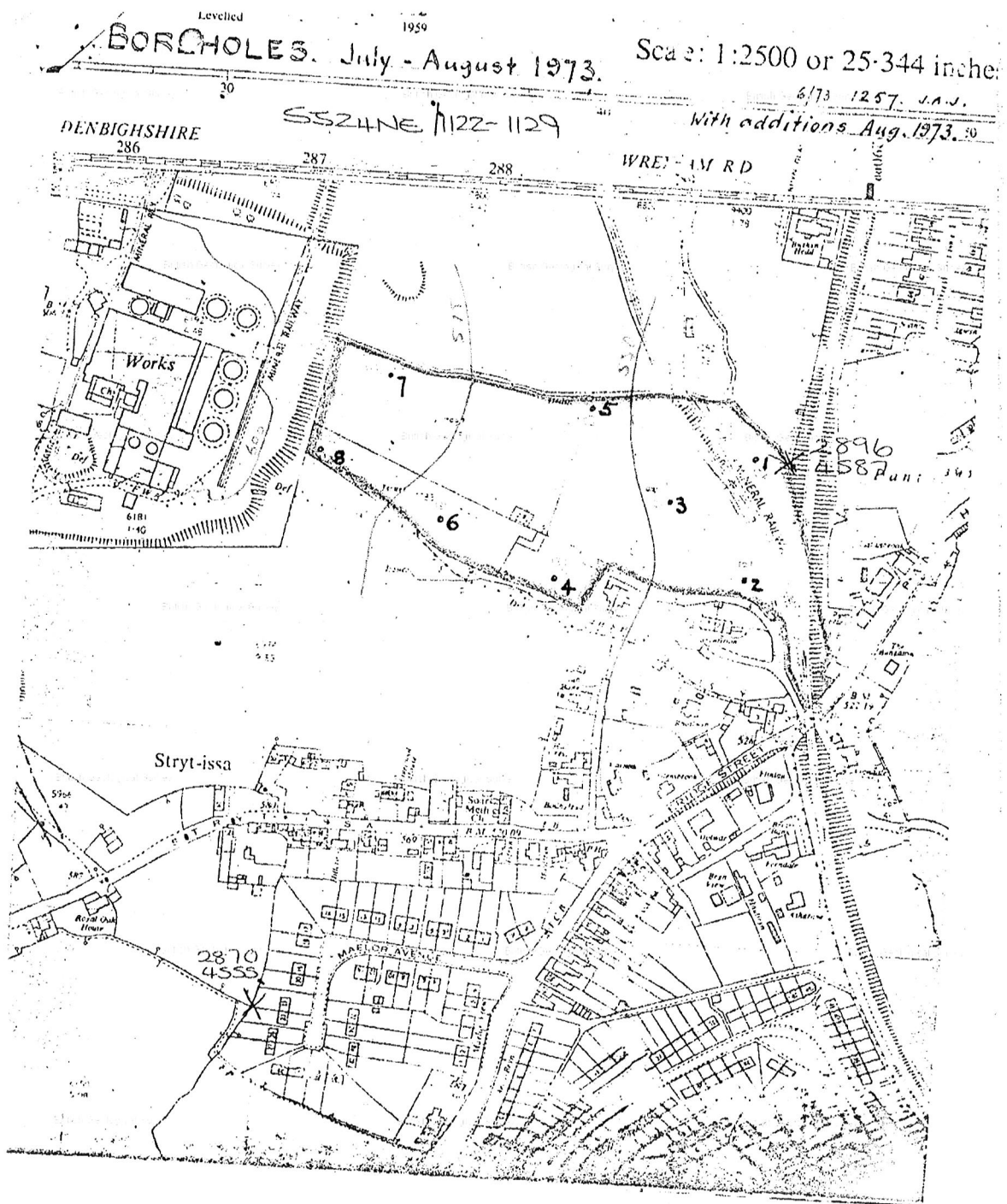
3. In my report dated 2nd June 1973, I stated that ten seams could be present under the site but the boreholes suggest that only four actually exist under the site, namely, Nant, Lower Yard, Wall and Bench and Llwynenion Half Yard, all of which have been worked prior to 1860. Some idea of the depths of these seams may be obtained when the five shafts, present on the site, are drilled in preparation for grouting.

18th. September 1973.

J. A. Jones

Chartered Surveyor (Minerals).





753351
Ext 99



**British
Geological Survey**

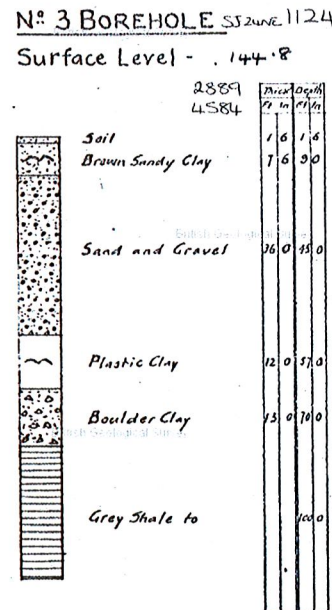
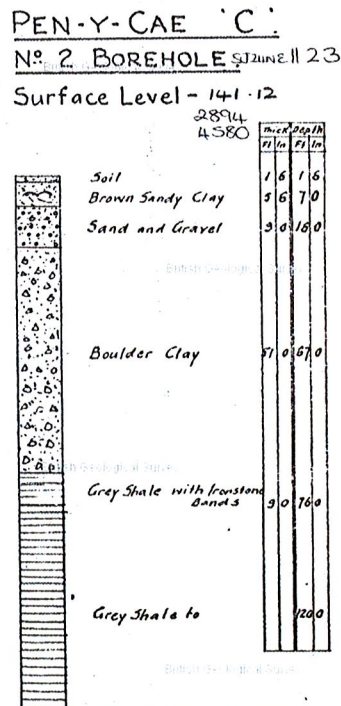
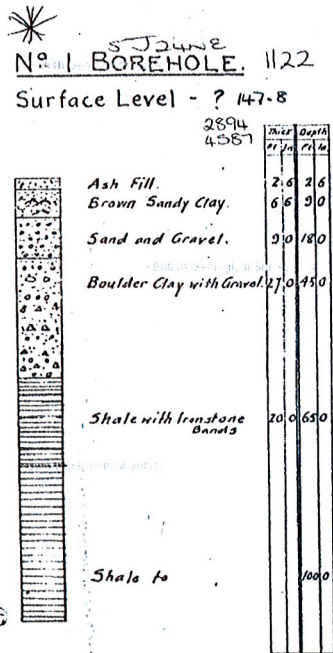
NATURAL ENVIRONMENT RESEARCH COUNCIL

Version 2.0.6

BGS ID: 143660 : BGS Reference:
SJ24NE1123
British National Grid (27700) :
328940,345800

[Report an issue with this borehole](#)

<< < Prev Page 3 of 3 Next > >>



FTH