

REF: 2032/SCP/RepLet/mjs

Lisa Parry
Blueprint Architectural Services
Office 3K4 Redwither Tower
Abbey Road
Wrexham Industrial Estate
Wrexham LL13 9XT

31st January 2018

Dear Lisa,

RE: SALEM CHAPEL, PONCIAU: SHALLOW MINING ASSESSMENT

1.0 Introduction

Mr G Thomas is proposing to demolish the existing Salem Chapel in Bank Street, Ponciau, Wrexham, and replace it with two detached houses.

The development is currently in for outline planning, and the Local Authority have obtained advice from the Coal Authority, which recorded the potential for shallow abandoned mine workings beneath the site.

Blueprint are the architects for the project, and they have appointed GroundSolve Ltd (GSL) on behalf of the client to undertake a desk study to confirm whether shallow abandoned mine workings is an issue for the site's development.

This report presents the findings of the desk study, and several adjacent site investigations to the site, and makes recommendations for the development to address the risks identified.

2.0 Site Location and Description

The site is located immediately north of Bank Street Ponciau, at National Grid Reference SJ 293 469. An aerial photograph showing the site obtained from the internet is presented below, along with a view of the chapel.

The site is bounded by open land and Grango School playing fields to the north, with existing housing to the east and west. Bank Street defines the southern site boundary, with further housing to the south. The site itself is currently still occupied by the Salem Chapel building.



3.0 Geology

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

- Wrexham Applied mapping project at a scale of 1:25,000,
- 1:50,000 scale geology plan, Sheet 121,
- Historical geology plans for the site,
- Geological memoirs.

The 1:50,000 and 1:25,000 scale plans show the site to be underlain by mudstone and sandstone bedrock. The Main Coal seam is shown outcropping on the western site boundary trending approximately north to south, with the Brassey and Crank coal seams outcropping to the west of the site.

This was generally confirmed by the historical plans, which show the Main coal seam outcropping immediately to the west of the site boundary. It also records the Main coal having been worked close to surface.

A major fault is shown immediately north of the site, trending in an east to west direction, with its downthrow to the south (Ty-Gwyn fault). Opencast coal mining is shown immediately north and south of the fault.

The geological memoirs record that on the south side of the Ty-Gwyn fault, Briscoe's Pits, now obliterated, are said to have reached the Brassy Coal at a depth of 64' (19.50m), and the Wall and Bench at 352' (107.30m). It records the Main coal having been dug to surface and the separation between the Brassey and the underlying coal (Crank/ Upper Yard) being 8.23m.

4.0 Mining

A Coal Authority opinion has been obtained by the Local Authority, dated September 2017, the main points are summarised below, and the report presented in full in Appendix A.

- The site falls within the defined Development High Risk Area,
- Historic unrecorded coals workings at shallow depth need to be considered for the development.

As insufficient information was provided by the client to address the CA concerns, they recommended that a Coal Mining Risk Assessment for the site be prepared for the Local Authority.

In addition, a Coal Authority mining report dated August 2017 has been provided, the main points of which are summarised below, with the report presented in full in Appendix A.

- The site is in an area that could be affected by underground mining in two seams of coal at 80 to 110m depth, last worked in 1867,

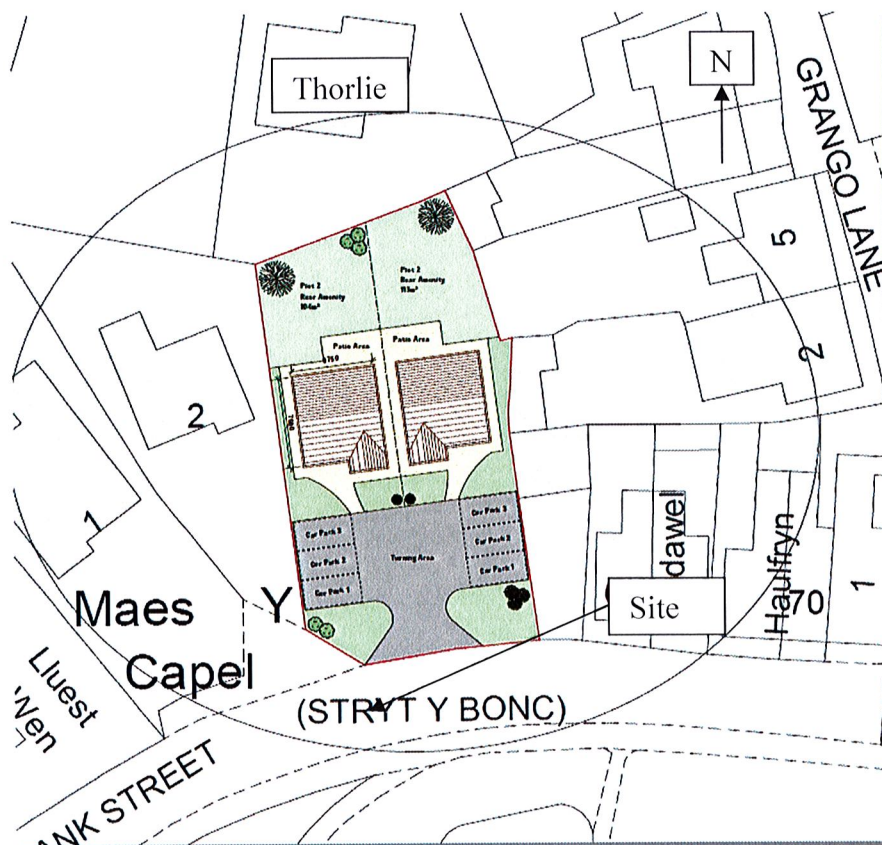
- In addition, the property is in an area where the Coal Authority believe there is coal at or close to surface, that may have been worked at some time in the past,
- There are no mine entrances within, or within 20m of the site boundary.

The report concluded that a prudent developer would seek appropriate technical advice before any work is undertaken.

In addition, mine plan NW 38 held in GSL archives was inspected. This shows the opencast workings immediately north of the site, and immediately south of the Ty-Gwyn fault. This shows workings in the Top and Bottom Brassey seams and Crank seam. It was proved to have been extensively worked with the top and bottom seams being some 3' thick (0.91m) and the underlying Crank seam being 1.807' thick (0.51).

5.0 Proposed Development

The proposed development comprises two detached dwellings. The present proposed layout is presented below.



6.0 Previous Investigations

Nkc Geotechnical 2003

Nkc Geotechnical investigated the location of a property called Thorlie, in 2003, which is immediately adjacent to the northern site boundary, see above. The findings of the investigation are presented in Appendix B.

It encountered colliery spoil up to 1.50m thick, overly brown sandy clay, with grey shale rock head at 2.80m. Predominantly collapsed pillar and stall workings were encountered in the Brassey Coal seam at 7.50m depth, with the underlying Crank coal being encountered at 18.10m. However, any workings in the Crank seam were considered to be too deep to affect surface stability.

Consequently, only the Brassey Seam was grouted, with 11.5 tonnes being recorded going into the workings. Of ten boreholes drilled, only one encountered solid coal, with six encountering backfilled/collapsed workings and two encountering cavitation.

The sequence encountered was as follows:

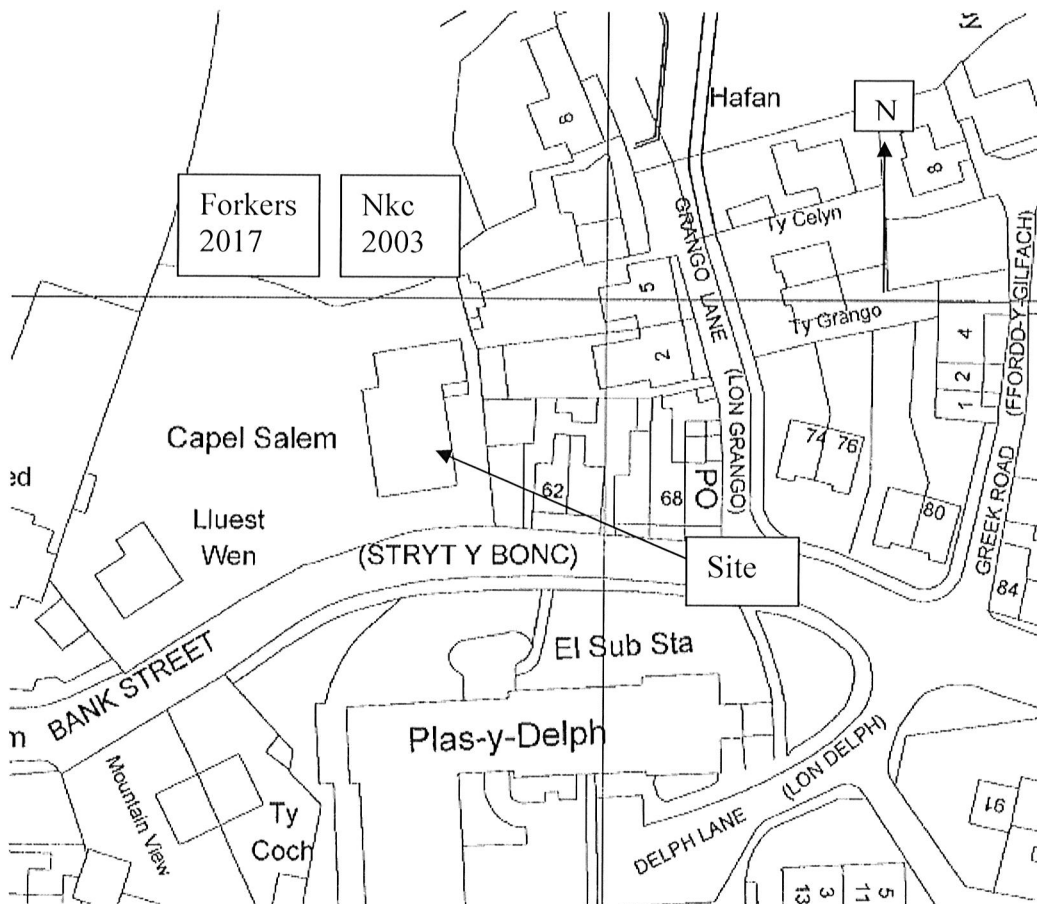
Depth (m)	Strata
0.0-1.50	Grey and black shale (Colliery Spoil)
1.50 – 2.80	Brown sandy Clay (Glacial Till)
2.80 – 7.80	Dark grey Mudstone
7.80 – 8.80	Brassey Coal
8.80 – 18.10	Grey Mudstone
18.10 – 19.20	Crank Coal
19.20 – 30.0	Grey Mudstone

Forkers 2018

In December 2017 the site immediately west of Thorlie was drilled and grouted by Forkers under the supervision of GSL.

It proved the Brassey Coal seam to be at a similar depth to the investigation above. However, the Crank coal seam was encountered at a depth of around 14m. The drilling recorded abstraction ratios of around 50% for both seams, with the Brassey and Crank coal seams being grouted, with just over 35 tonnes of grout being taken.

The locations of both investigations are presented below.



7.0 Discussion and Conclusion

From the information obtained, it is clear that the site will almost certainly have been underworked at shallow depth by two seams of coal, namely the Brassey and Crank coal seams.

It is possible to work the geology out using the information obtained, especially from the opencast mine immediately north of the site. This records the ground level, depth of excavation and also the underside of the coal seam encountered in the investigation.

This then makes it possible to calculate the dip and the strike of the seam. The dip was calculated as 8° (1 in 7), with a dip direction towards the south east, which corresponds closely to the values quoted in the geological memoirs.

Consequently, the Brassey seam would be anticipated to be slightly deeper than encountered by the nkc investigation in 2003.

The rock head has been proven to be at a depth of around 2.80m, which gives very little rock cover above the Brassey seam, i.e. around 4m, with the Crank seam some 6 to 7m below the Brassey seam. However, the depth to the Crank means that workings in this seam could exasperate the

problem with potential migration upwards into the Brassey seam, although no evidence of upward migration was encountered in the above investigations.

While the drilling and grouting on the above sites failed to encounter any voids in the working, their presence should not be discounted as roadways may still be open.

It is therefore recommended that both coals seams beneath the site be drilled and grouted to stabilise the ground beneath the site. However, the previous investigations have indicated a difference in the separation between the Brassey and Crank seams, I.e. they were much closer together in the Forkers investigation. Therefore, there is a possibility that grouting of the Crank seam may not be required.

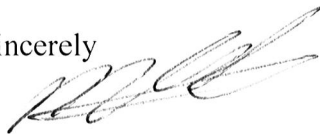
If the seams prove to have been worked, the plots should then be founded on raft foundations designed to span potential voids of 3m and cantilever 1.5m at its edge. However, these foundation recommendations should be reviewed once the drill and grout contract has been completed.

It should also be noted that the shallow nature of the underlying Brassey seam means that the presence of unrecorded shafts/ Bell pits cannot be discounted.

Based on the cost and grout quantities on the adjacent sites budgets of between £7,500 and £10,000 should be allowed for each plot.

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

Yours sincerely

A handwritten signature in black ink, appearing to read 'M J Scott', written in a cursive style.

M J Scott

APPENDIX A

Coal Authority Reports



The Coal
Authority

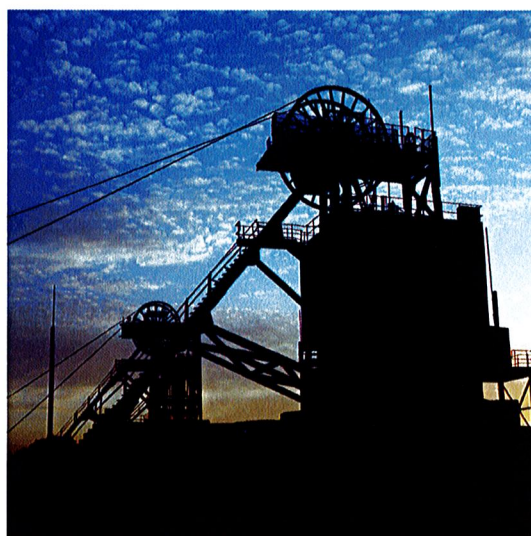
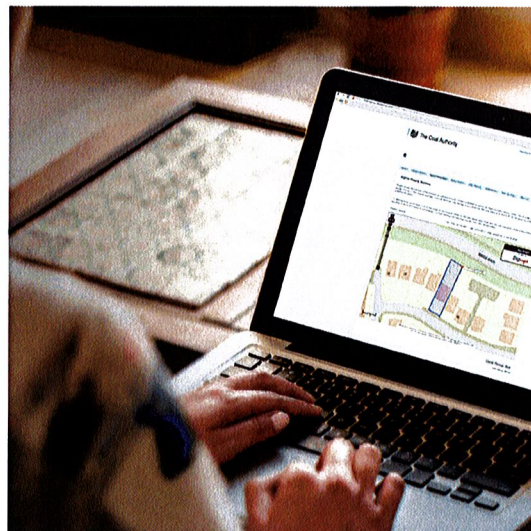
Resolving the **impacts** of mining

CON29M Non-Residential Mining Report

LAND ADJ TO SALEM CHAPEL
BANK STREET
PONCIAU
WREXHAM
LL14 1EN

Date of enquiry: 07 August 2017
Date enquiry received: 07 August 2017
Issue date: 07 August 2017

Our reference: 51001552897001
Your reference: Myrffi



CON29M Non-Residential Mining Report

This report is based on, and limited to, the records held by the Coal Authority and the Cheshire Brine Subsidence Compensation Board's records, at the time we answer the search.

Client name

Rhyn Myrffi

Enquiry address

LAND ADJ TO SALEM CHAPEL, BANK STREET,
PONCIAU, WREXHAM, LL14 1EN

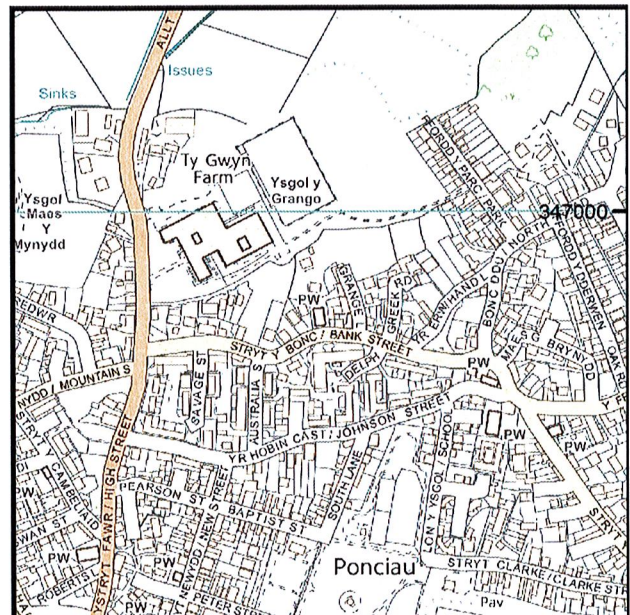
How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com

 /company/the-coal-authority
 /thecoalauthority
 /coalauthority



Approximate position of property



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Summary

Has the search report highlighted evidence or potential of		
1	Past underground coal mining	Yes
2	Present underground coal mining	No
3	Future underground coal mining	Yes
4	Mine entries	Yes
5	Coal mining geology	No
6	Past opencast coal mining	No
7	Present opencast coal mining	No
8	Future opencast coal mining	No
9	Coal mining subsidence	No
10	Mine gas	No
11	Hazards related to coal mining	No
12	Withdrawal of support	No
13	Working facilities order	No
14	Payments to owners of former copyhold land	No
15	Information from the Cheshire Brine Subsidence Compensation Board	No

For detailed findings, please go to page 4.

Detailed findings

1. Past underground coal mining

The property is in a surface area that could be affected by underground mining in 2 seams of coal at 80m to 110m depth, and last worked in 1867.

Any movement in the ground due to coal mining activity should have stopped.

In addition the property is in an area where the Coal Authority believe there is coal at or close to the surface. This coal may have been worked at some time in the past. The potential presence of coal workings at or close to the surface should be considered prior to any site works or future development activity. Your attention is drawn to the Comments on the Coal Authority information section of the report.

2. Present underground coal mining

The property is not within a surface area that could be affected by present underground mining.

3. Future underground coal mining

The property is not in an area where the Coal Authority has plans to grant a licence to remove coal using underground methods.

The property is not in an area where a licence has been granted to remove or otherwise work coal using underground methods.

The property is not in an area likely to be affected from any planned future underground coal mining.

However, reserves of coal exist in the local area which could be worked at some time in the future.

No notices have been given, under section 46 of the Coal Mining Subsidence Act 1991, stating that the land is at risk of subsidence.

4. Mine entries

There are no known coal mine entries within, or within 20 metres of, the boundary of the property.

There may however be mine entries/additional mine entries in the local area which the Coal Authority has no knowledge of.

5. Coal mining geology

The Coal Authority is not aware of any damage due to geological faults or other lines of weakness that have been affected by coal mining.

6. Past opencast coal mining

The property is not within the boundary of an opencast site from which coal has been removed by opencast methods.

7. Present opencast coal mining

The property does not lie within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods.

8. Future opencast coal mining

There are no licence requests outstanding to remove coal by opencast methods within 800 metres of the boundary.

The property is not within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted.

9. Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres, 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.

10. Mine gas

The Coal Authority has no record of a mine gas emission requiring action.

11. Hazards related to coal mining

The property has not been subject to remedial works, by or on behalf of the Authority, under its Emergency Surface Hazard Call Out procedures.

12. Withdrawal of support

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.

13. Working facilities order

The property is not in an area where an order has been made, under the provisions of the Mines (Working Facilities and Support) Acts 1923 and 1966 or any statutory modification or amendment thereof.

14. 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.

15. Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Comments on the Coal Authority information

The Coal Authority own the copyright in this report and the information used is protected by our database right.

In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore 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 good engineering practice developed for mining areas. No development should be undertaken that intersects, disturbs or interferes with any coal or mines of coal without the permission of the Coal Authority. Developers should be aware that the investigation of coal seams/former mines of coal may have the potential to generate and/or displace underground gases and these risks both under and adjacent to the development should be fully considered in developing any proposals. The need for effective measures to prevent gases entering into public properties either during investigation or after development also needs to be assessed and properly addressed. This is necessary due to the public safety implications of any development in these circumstances.

A site investigation was carried out in September 2003 by NKC Geotech Ltd 25 Grosvenor Road, Wrexham, LL11 1BT.

Additional remarks

Information provided by the Coal Authority in this report is compiled in response to the Law Society's Con29M Coal Mining and Brine Subsidence Claim enquiries. The said enquiries are protected by copyright owned by the Law Society of 113 Chancery Lane, London WC2A 1PL. Please note that Brine Subsidence Claim enquiries are only relevant for England and Wales. This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions applicable at the time the report was produced.

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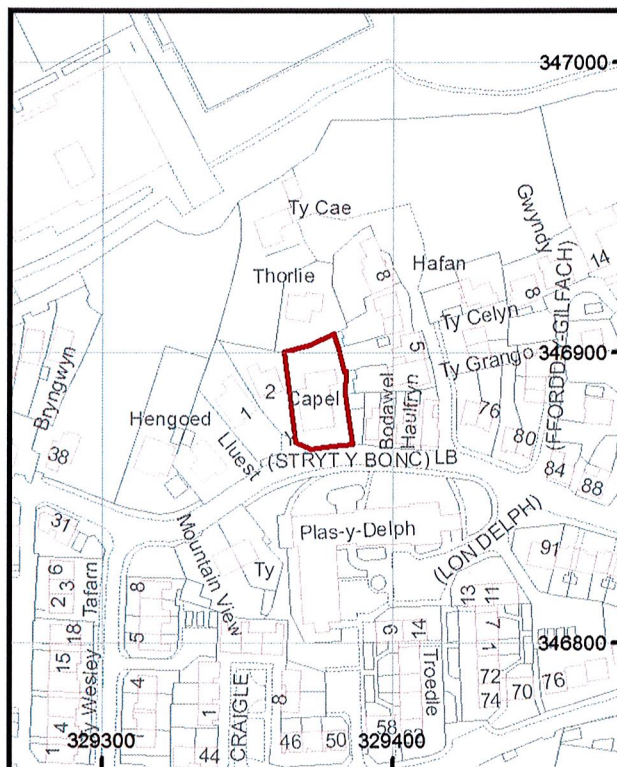
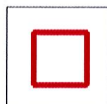
Alternative formats

If you would like this report in an alternative format, please contact our communications team.

Enquiry boundary

Key

Approximate position of enquiry boundary shown



How to contact us

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200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com



/company/the-coal-authority



/thecoalauthority



/coalauthority



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VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	07 August 2017
Issued to	RHYN MYRFFI LAND ADJ TO SALEM CHAPEL BANK STREET PONCIAU WREXHAM LL14 1EN
Property search for	LAND ADJ TO SALEM CHAPEL BANK STREET PONCIAU WREXHAM LL14 1EN
Reference number	51001552897001
Date of issue	07 August 2017
Cost	£78.30
VAT @ 20%	£15.66
Total received	£93.96
VAT registration	598 5850 68

For the Attention of: Mr P Forster – Case Officer
Wrexham County Borough Council

[By Email: planning@wrexham.gov.uk]

5 September 2017

Dear Mr Forster

PLANNING APPLICATION: P/2017/0666

Outline application for demolition of existing chapel, residential development (2 detached dwellings) and access arrangements; Salem Chapel, Bank Street, Ponciau, Wrexham

Thank you for your notification of 15 August 2017 seeking the views of The Coal Authority on the above planning application.

The Coal Authority is a non-departmental public body sponsored by the Department for Business, Energy & Industrial Strategy. As a statutory consultee, The Coal Authority has a duty to respond to planning applications and development plans in order to protect the public and the environment in mining areas.

The Coal Authority Response: Substantive Concern

I have reviewed the proposals and confirm that the application site falls within the defined Development High Risk Area.

The Coal Authority records indicate that within the application site and surrounding area there are coal mining features and hazards which need to be considered in relation to the determination of this planning application, specifically likely historic unrecorded coal workings at shallow depth.

The applicant has submitted some coal mining information to accompany the planning application; however, the Coal Authority does not consider this adequately addresses the impact of coal mining legacy on the proposed development.

The Coal Authority therefore **objects** to this planning application, and we consider that the applicant needs to submit the required Coal Mining Risk Assessment Report, or equivalent, to the LPA.

It is a requirement of Planning Policy Wales, paragraph 13.9 that the applicant demonstrates to the satisfaction of the LPA that the application site is safe, stable and suitable for development. In addition the national validation list in Wales requires planning applications in the defined Development High Risk Area need to be accompanied by a Coal Mining Risk Assessment.

The Coal Authority Recommendation to the LPA

In accordance with the agreed risk-based approach to development management in the defined Development High Risk Areas, the applicant should be informed that they need to submit a Coal Mining Risk Assessment Report as part of this application, prepared by a suitably qualified person. Without such a risk assessment, the Coal Authority does not consider that the LPA has sufficient information to determine this planning application and therefore **objects** to this proposal.

The applicant has simply submitted a Coal Mining Report (such as a Non-Residential Coal Mining Report, an Enviro-All-in-One Report or other factual report) in support of this planning application. The submission of a Coal Mining Report is not a Coal Mining Risk Assessment. The Coal Mining Report provides the basic coal mining information in relation to the application site; it does not provide an assessment of the risks to any proposed new development on the site.

The applicant should use this coal mining information to assess whether or not past mining activity poses any risk to their development proposal and, where necessary, propose mitigation measures to address any issues of land instability. This could include further intrusive site investigation to ensure that the LPA has sufficient information to determine the planning application.

The Coal Authority would be very pleased to receive for further consultation and comment any additional information prepared and submitted by the applicant.

Please do not hesitate to contact me if you would like to discuss this matter further.

Yours sincerely

Melanie Lindsley

Melanie Lindsley BA (Hons), DipEH, DipURP, MA, PGCertUD, PGCertSP, MRTPI
Planning Liaison Manager

General Information for the Applicant

The coal mining information within the Coal Mining Report (such as a Non-Residential Coal Mining Report, an Enviro-All-in-One Report or other factual report) already obtained should be used as the basis for a Coal Mining Risk Assessment Report (CMRA). The CMRA should assess whether or not past mining activity poses any risk to the development proposal and, if necessary, propose mitigation measures to address any issues of land instability. This could include further intrusive investigation on site to ensure that the Local Planning Authority has sufficient information to determine the planning application.

The need for a Coal Mining Risk Assessment is set out in the National Planning Practice Guide at:

<http://planningguidance.planningportal.gov.uk/blog/guidance/land-stability/land-stability-guidance/>

The Coal Mining Risk Assessment should be prepared by a “competent body”. Links to the relevant professional institutions of competent bodies can be found at:

<https://www.gov.uk/planning-applications-coal-mining-risk-assessments>

Guidance on how to produce a Coal Mining Risk Assessment and a template which the “competent body” can utilise is also contained at:

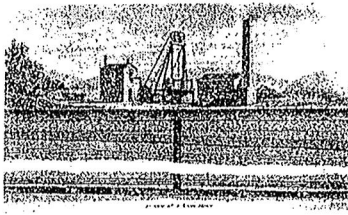
<https://www.gov.uk/planning-applications-coal-mining-risk-assessments>

Disclaimer

The above consultation response is provided by The Coal Authority as a Statutory Consultee and is based upon the latest available data on the date of the response, and electronic consultation records held by The Coal Authority since 1 April 2013. The comments made are also based upon only the information provided to The Coal Authority by the Local Planning Authority and/or has been published on the Council's website for consultation purposes in relation to this specific planning application. The views and conclusions contained in this response may be subject to review and amendment by The Coal Authority if additional or new data/information (such as a revised Coal Mining Risk Assessment) is provided by the Local Planning Authority or the Applicant for consultation purposes.

APPENDIX B

Nkc Investigation 2003

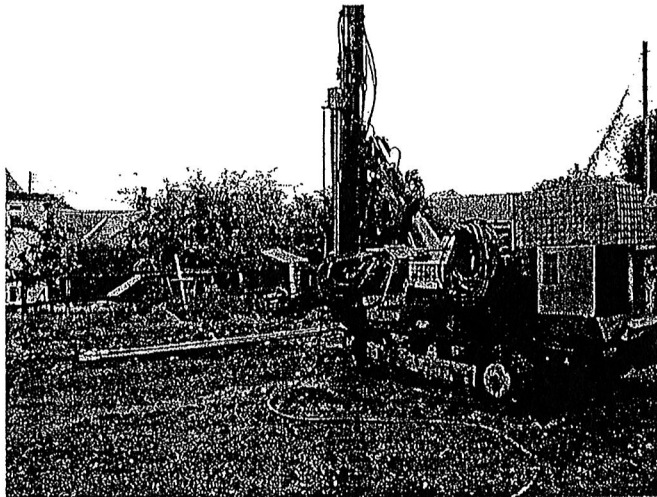


Nkc Geotech Ltd

25 Grosvenor Road
Wrexham
LL11 1BT

tel
01352 762080
fax
01352 762081
email
neil@nkc.co.uk

Mining Investigation Report

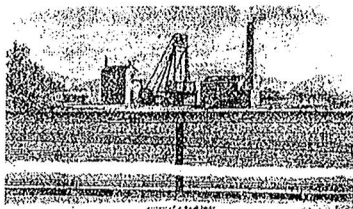


Grango Lane, Ponciau

0309
1 September 2003

Mr A P Hughes Lloyd
Newlyn
1 Duke Street
Rhos
Wrexham LL14 1SU
3 0309 1 September 2003





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- 5 site description and investigation results
- 6 management of geotechnical hazards
- 7 borehole plan
- 8 results of remedial work
- 9 drilling logs and section
- 10 method statement

extract

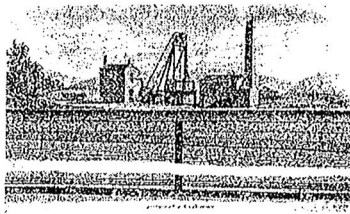
This report meets NHBC D5 and D6 requirements

The site is undermined by old workings which have been stabilised by grouting

4 0309 1 September 2003



Printed on recycled paper



Site

A plot for one dwelling at Grango Lane, Ponciau.

Investigation and site work by

Neil Catlow B.Sc F.G.S Engineering geologist.

Records inspected

Coal Authority at Mansfield.

Geological Survey.

My previous investigations in this vicinity.

Investigation results

Ground level

Unchanged throughout the investigation.

Site history

The site was formerly agricultural land.

Gas testing

There were no methane or carbon dioxide emissions during the investigation period. See borehole logs for gas testing results.

Radon

The site lies in an area susceptible to radon. Radon can only be accurately detected over a three month test period, beyond the scope of this investigation. Precautions against radon accumulation should be taken in the absence of evidence of no radon presence.

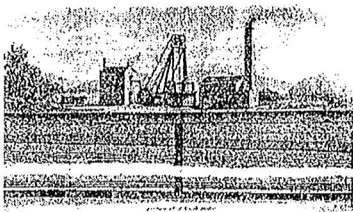
Foundation soils

Colliery derived shale fill upto 1.5m in thickness overlying brown sandy clay. Grey shale rockhead at predominantly 2.8m. See borehole logs for SPT testing results.

5 0309 1 September 2003



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Shallow mineworkings

Predominantly collapsed pillar & stall workings in the Brassey Coal at 7.5m. The Crank Coal is at 18.1m but any workings in this seam are too deep to affect surface stability. See log for Bh1. The grout holes show that the Main Coal outcrops across the eastern part of the site, and has been worked from the surface with the result that there is a variable fill thickness in the grout holes.

Disused mineshafts

There are no records of any shafts on or within 20 metres of the site, but the Brassey Coal workings are so shallow that old unrecorded shafts are very probably present.

Hazard management

There are old and unrecorded mineworkings present in the Brassey Coal. Subsidence of these workings could cause crown holes to be formed on the site, with dimensions of upto 2.0m deep and 2.0m diameter. There may also be old and unrecorded mineshafts upto 2.0m in diameter present under the fill.

Ground improvement

Stabilise the mineworkings by grouting to prevent further void migration under the proposed buildings. I have personally carried out this remedial work - see results of remedial work.

Specialist foundations

Use a structural foundation designed to span 3.0m in case there are old infilled crown holes and unrecorded shafts present.

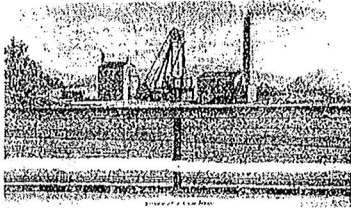
For Nkc Geotech Ltd

Neil Catlow, B.Sc, F.G.S

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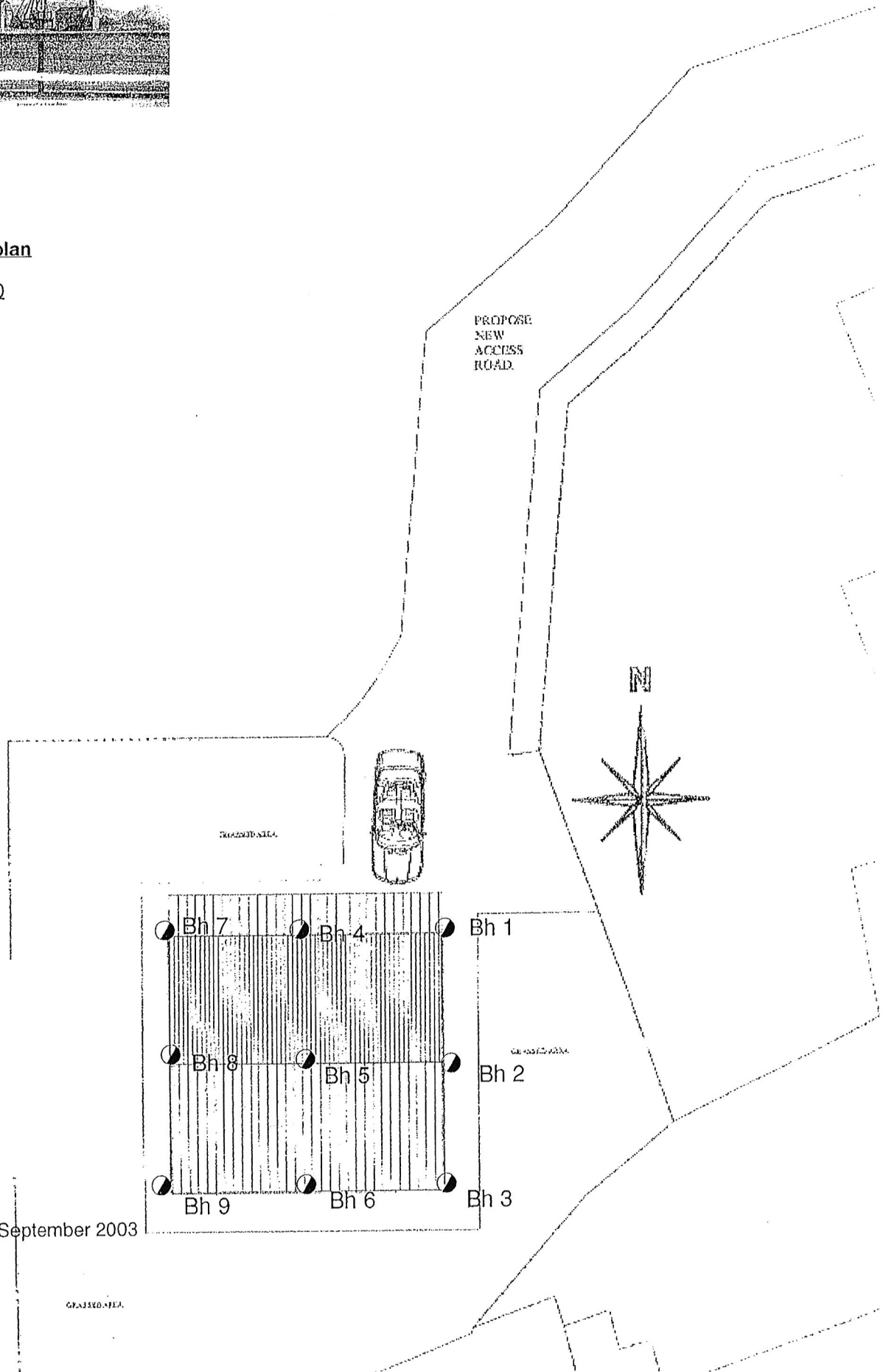


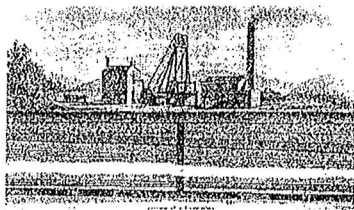
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Borehole plan

Scale 1:200





Results of remedial work

hole	seam depth*	hole depth	grout take	status code	comments
Bh 1	7.8	30.0	0.0	sd	1.5m fill
Bh 2	8.0	12.0	1.0	cd	2.0m fill
Bh 3	7.2	12.0	2.8	cn	1.5m fill
Bh 4	8.0	12.0	1.2	cd	1.5m fill
Bh 5	8.0	12.0	1.0	cd	1.5m fill
Bh 6	7.7	12.0	1.0	cd	3.0m fill
Bh 7	7.0	12.0	1.8	cn	1.0m fill
Bh 8	7.5	12.0	1.3	cd	1.5m fill
Bh 9	7.5	12.0	1.4	cd	1.0m fill

Grout mix 4:1 rockdust/PFA/cement and measured in dry tonnes

Injection pressure <150kN/m²

All work carried out by Neil Catlow B.Sc, F.G.S

Total grout take dry tonnes 11.5 tonnes

* or depth to mineworkings or migrating cavity

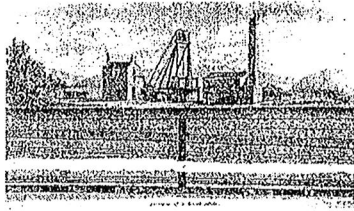
Status codes sd solid cd collapsed cn cavitation vd void

Borehole numbers with a i suffix are inclined

8 0309 1 September 2003



Printed on recycled paper



Method statement for remedial works

Stabilisation of mineworkings by grouting

This work follows an initial investigation of a site which has shown that a coal seam of economic importance is present at shallow depth and has been mined. There are therefore geotechnical hazards present.

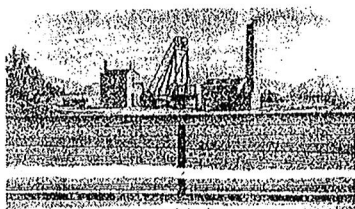
Shallow mineworkings are stabilised by drilling a grid of holes 65mm or 75mm diameter down through the coal seam on an initial 6.0m grid pattern over the bearing area of the proposed building, reducing to 3.0m spacing when open workings are encountered. The workings are grouted using 4:1:1 sand/PFA/cement ready-mixed grout injected by casing to the bottom of the hole, and pressurised to 150 - 200kN/m² when filled.

I carry out all this site work personally, and keep full records of each hole.

The report is submitted on completion is required for NHBC Validation D7.

9 0309 1 September 2003





Bh 1

REF 0309
Bh 1

SITE CLIENT
Grango Lane, Ponciau
Mr A P Hughes-Lloyd

TITLE
n/a

ORIGIN
printout direct from rig on site
drilled & logged by Neil Catlow

DATE
SCALE
OSGN

1 September 2003
1:200

ORIENTATION
FLUSH
BIT

vertical
water
t/c 75mm

SPT
N value

SECTION

DEPTH	STRATA	GRAPHIC	DESCRIPTION
0.0	0.0	fill	grey and black shale
0.5			
1.0			
1.5	1.5	clay	brown, sandy
2.0			
2.5			
3.0	2.8	shale	black, soft drilling
3.5			
4.0	4.1	shale	dark grey, firm drilling
4.5			
5.0			
5.5			
6.0			
6.5			
7.0			
7.5	7.8	coal	black, soft drilling
8.0			
8.5			
9.0	8.8	shale	dark grey, firm drilling
9.5			
10.0			
10.5			
11.0			
11.5			
12.0			
12.5			
13.0	13.2	mudstone	grey, firm drilling
13.5			
14.0			
14.5			
15.0			
15.5			
16.0			
16.5			
17.0			
17.5			
18.0	18.1	coal	black, soft drilling
18.5			
19.0			
19.5	19.2	mudstone	grey, firm drilling
20.0			
20.5			
21.0			
21.5			
22.0			
22.5			
23.0			
23.5			
24.0			
24.5			
25.0			
25.5			
26.0			
26.5			
27.0			
27.5			
28.0			
28.5			
29.0			
29.5			
30.0	30.0		bottom of hole

4 @ 1.0m

5 @ 2.0m

9 @ 3.0m

9 @ 4.0m

ground level

Brassey Coal

Crank Coal

IN HOLE GAS TESTING

% oxygen	20.7
% methane	0.0
% carbon dioxide	0.0
% LEL	0.0

Nkc Geotech Ltd
25 Grosvenor Road
Wrexham
LL11 1BT

www.nkc.co.uk

