

Mining Investigation Report

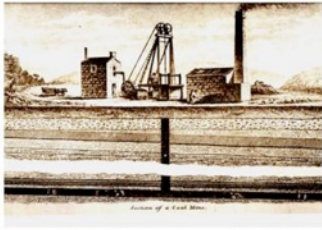


Queens Road, Brymbo

Rob Edwards
58 Ffordd Llewellyn
Acton
Wrexham
LL12 8JP

1415
25 August 2015

Nkc Geotech Ltd
25 Grosvenor Road
Wrexham
LL11 1BT



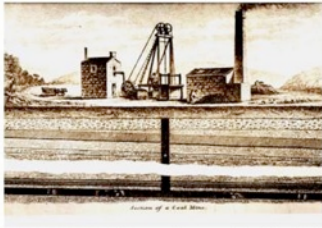
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extract

This report meets NHBC D6 Detailed Investigation requirements
The site is undermined by old mineworkings



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Site

A small site for residential development where it is intended to construct two dwellings.

Investigation and site work by

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

Records inspected

Coal Authority at Mansfield.

Geological Survey.

Coal Authority Report 610001175001 dated June 3rd 2013

Ordnance Surveys 1:2500 from First Edition 1871 to 1912

Geological Survey 1:10560 plan

My previous investigations in this vicinity, most relevant being Burns Builders residential site adjacent to the north in 1997, and TRE Developments residential development west of Queens Road in March 2013.

Investigation results

Ground level

Unchanged throughout the investigation.

Site history

The site was formerly vacant land with a small garage at road level. The site is steeply sloping upwards to the east and has been recently terraced with gabion and blockwork retaining walls. There is no recorded former industrial use.

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

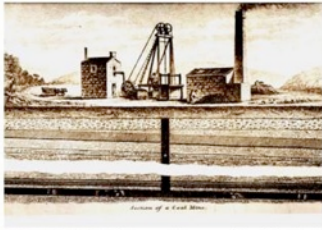
Brown clay and grey shale which may be fill upto 2.4m in thickness under Plot 1 overlies the shale rockhead which is exposed under Plot 2. See borehole logs for SPT testing results.

Geology

The site lies on Carboniferous Westphalian rocks that form the North Wales Coalfield, dipping to the east at 1 in 7. These rocks are predominantly shales and sandstones containing seams of coal upto 3.0m in thickness at vertical intervals typically varying from 4.0m to 20.0m. The coal seams are of economic importance and given an identity, for example Hollin Coal, Brassey Coal, and Main Coal when they are of sufficient quality and thickness to justify extraction by mining from the surface or at depth from mineshafts. Coal mining in North Wales was recorded in 1347 at Ewloe, but the greatest extraction within 90m of the surface took place in the period 1750 to 1850.

The Geological Survey, confirmed by the workings of Holland Colliery 200m north of the site in 1940, show the following coal seams in descending order close to the surface in this vicinity:

Powell Coal	1.2m thick
Two Yard Coal	2.1m thick
Crank Coal	1.0m thick



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There are plans of mineworkings immediately adjacent to the site in the Main Coal coal seam at a depth of 90m. This seam was worked in 1800 by Wilkinson during the formative years of the Brymbo iron and steel industry.

There are no plans of any mining shallower than the Main Coal.

Shallow mineworkings

The investigation boreholes found collapsed pillar & stall workings in the Two Yard Coal at 10.4m under Plot 2, and solid coal at this horizon from 6.9m to 8.7m under Plot 1. The outcrop of the overlying Powell Coal is present immediately east of Plot 2 and was visible during the construction of the gabion wall. The outcrop of the Two Yard Coal was proved on the Burns site to the north in 1997 and on the TRE site to the south in 2014. The Crank Coal outcrops in the valley floor under the Wrexham Road, west of the site.

Open voids in the Crank Coal were encountered at 25.5m and 27.5m in the boreholes. These workings lie too deep to affect surface stability.

See logs for Bhs 1 and 2.

Disused mineshafts

There are no records of any shafts or adits on or within 20 metres of the site.

Hazard management

Summary

There are old and unrecorded mineworkings present in the Two Yard 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. The overlying Powell Coal outcrops above the proposed plots but underlies the valley side above the gabion wall. The Crank Coal is too deep to affect surface stability.

Ground improvement

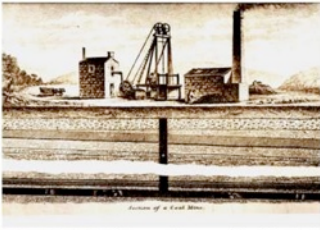
The mineworkings must be stabilised by grouting to prevent further void migration under the proposed dwellings by grouting the Two Yard Coal workings. The stability of the new retaining walls may be compromised by the shallow mineworkings.

Specialist foundations

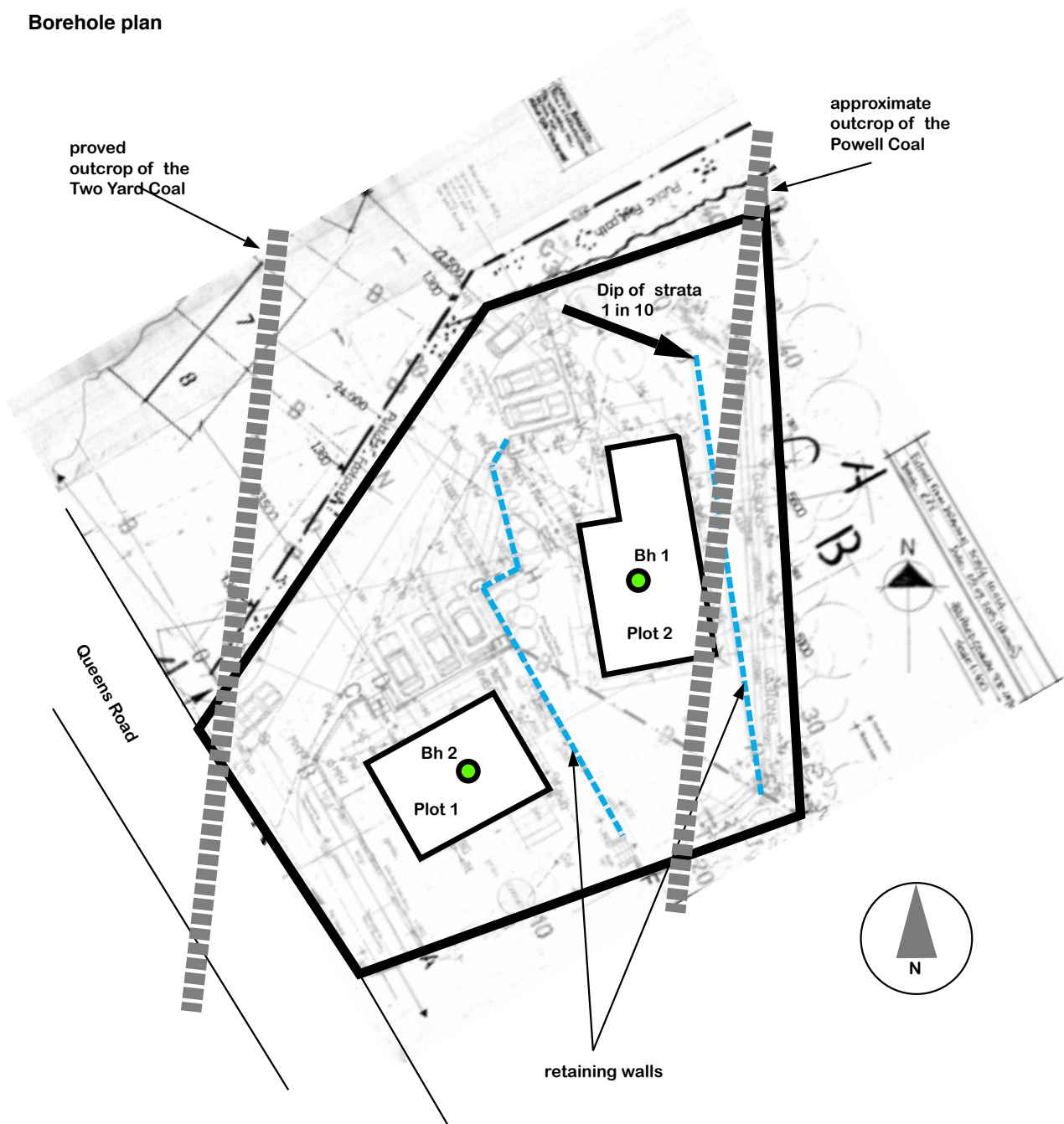
The proposed dwellings should use a structural foundation, either a raft or reinforced strips, designed to span 3.0m in case there are old infilled crown holes and unrecorded mine entries present.

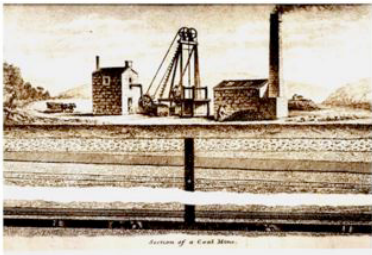
For Nkc Geotech Ltd

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



Borehole plan





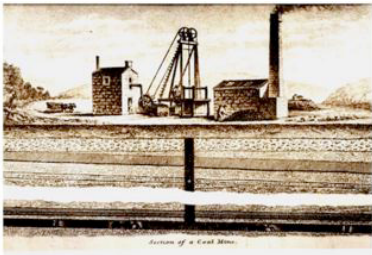
REF	1415	SITE	Queens Road, Brymbo		PRINTOUT	25 Aug 2015
Bh	1	CLIENT	Rob Edwards		SCALE	1:200
		TITLE			OSGN	
		ORIGIN	printout direct from rig on site drilled & logged by Neil Catlow		ORIENTATION	vertical
					FLUSH	water
					BIT	75mm T/C
	DEPTH	STRATA	GRAPHIC	DESCRIPTION	SPT N value	SECTION
0.0	0.0	shale		grey, firm drilling		ground level
0.5				with coal traces	7	rockhead and
1.0						outcrop of Powell Coal
1.5						
2.0	2.1	shale		grey, firm drilling	9	
2.5				with brown sandstone layers		
3.0						
3.5	3.3	sandstone		brown, soft drilling		
4.0				with grey shale layers		
4.5						
5.0						
5.5						
6.0						
6.5						
7.0						
7.5						
8.0	8.1	mudstone		grey, firm drilling		
8.5						
9.0						
9.5	9.8	shale		black, soft drilling		Two Yard Coal
10.0						old workings
10.5	10.4	coal		black, loose coal, small voids		
11.0						
11.5						
12.0	11.8	shale		grey, firm drilling		
12.5						
13.0						
13.5						
14.0						
14.5						
15.0						
15.5						
16.0						
16.5						
17.0						
17.5						
18.0						
18.5						
19.0						
19.5						
20.0						
20.5						
21.0						
21.5						
22.0						
22.5						
23.0						
23.5						
24.0						
24.5						
25.0						
25.5	25.5	shale		black, soft drilling		
26.0						
26.5						
27.0						
27.5	27.5	cavity	!	!		Crank Coal
28.0			!	!		old workings
28.5			!	!		
29.0	29.2	shale		black, soft drilling		
29.5						
30.0	30.0			bottom of hole		

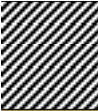
IN HOLE GAS TESTING

%	O2	20.6
%	CH4	0.0
%	CO2	0.0
%	LEL	0.0
ppm	H2S	0.0
ppm	CO	0.0



drilled and logged by
Neil Catlow B.Sc FGS



REF	1415	SITE	Queens Road, Brymbo		PRINTOUT	25 Aug 2015
Bh	2	CLIENT	Rob Edwards		SCALE	1:200
		TITLE			OSGN	
		ORIGIN	printout direct from rig on site drilled & logged by Neil Catlow		ORIENTATION	vertical
					FLUSH	water
					BIT	75mm T/C
	DEPTH	STRATA	GRAPHIC	DESCRIPTION	SPT N value	SECTION
0.0	0.0	fill ?		brown clay		ground level
0.5					5	
1.0					5	rockhead
1.5						
2.0						
2.5	2.4	sandstone		brown, firm drilling	9	
3.0						
3.5						
4.0						
4.5						
5.0				black, soft drilling		Two Yard Coal
5.5	6.5	shale				
6.0	6.9	coal		black, soft drilling		
6.5						
7.0						
7.5				black, soft drilling		
8.0						
8.5						
9.0	8.7	shale				
9.5						
10.0	10.1	coal		black, soft drilling		
10.5	10.4	shale		grey, firm drilling		
11.0						
11.5						
12.0						
12.5						
13.0						
13.5						
14.0						
14.5						
15.0						
15.5						
16.0						
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18.5						
19.0						
19.5						
20.0						
20.5						
21.0						
21.5						
22.0						
22.5						
23.0						
23.5	23.4	shale		black, soft drilling		
24.0						
24.5						
25.0						Crank Coal
25.5	25.5	cavity				
26.0						
26.5						
27.0	26.9	shale		black, soft drilling		
27.5						
28.0				bottom of hole		
28.5						
29.0						
29.5						
30.0	30.0			bottom of hole		

IN HOLE GAS TESTING

%	O2	20.6
%	CH4	0.0
%	CO2	0.0
%	LEL	0.0
ppm	H2S	0.0
ppm	CO	0.0



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Nkc Geotech Ltd
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Wrexham
LL11 1BT
www.nkc.co.uk