

Received 20.2.2013 P/2012/0010

Wern School Rhosllanerchrugog

Geotechnical Report

Heed Developments Ltd



GroundSolve Ltd

Consulting Geotechnical, Engineering Geology and Environmental Engineers

CONTENTS

1.0 INTRODUCTION	1
2.0 THE SITE	2
2.1 Site Location and Description	2
2.2 Geology	2
2.3 Abandoned Mining	3
2.4 History	4
3.0 ENVIRONMENTAL SEARCHES	5
4.0 PROPOSED DEVELOPMENT	6
5.0 THE INVESTIGATION	7
5.1 Previous Investigation	7
5.2 This Investigation	7
6.0 GROUND CONDITIONS	9
6.1 Summary of Ground Conditions	9
6.2 Made Ground	9
6.3 Glacial Till	10
6.4 Bedrock	10
6.5 Groundwater	10
6.6 Mine Shaft Cap Construction	10
7.0 RESULTS OF CHEMICAL TESTING	11
8.0 MINING RISK ASSESSMENT	14
8.1 Risk Assessment	14
8.2 Conclusions and Recommendations	17
9.0 GEOTECHNICAL RECOMMENDATIONS	19
9.1 Excavations and Site Preparation	19
9.2 Foundations and Floor Slabs	19
9.3 Access Road	21
9.4 Protection of Buried Concrete	21
9.5 Landfill and Radon Gas	21
9.6 Environmental Issues	21
REFERENCES	23

FIGURES

1. Site Location
2. Existing Site Layout
3. History 1850
4. Proposed development
5. Exploratory Hole Locations and Ground Constraints
6. Cross Section

APPENDICES

- A Site Photographs
- B Coal Authority Report and Permissions
- C Groundsure Report
- D Borehole Logs (Previous Investigation)
- E Borehole Test Results
- F Physical Test Results
- G Chemical Test Results

1.0 INTRODUCTION

Heed Developments Ltd (HD) proposes to build fifteen traditional two storey houses on the site of the old Wern School in Rhosllanerchrugog to the west of Wrexham Town centre. Most of the houses are semi detached, although there are several detached houses. The Architects for the scheme are blueprint architectural services.

The potential for shallow abandoned mine workings has been identified at the site and at least one mine shaft was known to be present. Consequently, BD have appointed GroundSolve Ltd (GSL) to undertake a mining investigation at the site to enable appropriate remedial measures to be carried out. No desk study has been requested as part of this commission, although GSL have included information already held in their archives.

This report presents the findings of the work and gives risk assessments and recommendations to address the mining issues. In addition, firm geotechnical recommendations are given for the development and environmental comments are also presented.

2.0 THE SITE

2.1 Site Location and Description

The site is located on the old Wern School site in Rhosllanerchrugog to the west of Wrexham Town Centre at National Grid reference SJ 293 463, see Figure 1.

The site is surrounded by existing housing and is accessed from the north off Hill Street. It is bounded to the east by Pen y Graig Road and a lane called Lon Y Wern is on the southern site boundary, see Figure 2.

It is some 200m long and is generally around 80m wide. The site elevation falls from around 174.5mOD in the west to 166.3mOD on the eastern site boundary.

The previous site layout as shown in the topographic survey is presented in Figure 2. Prior to demolition of the school there was a large retaining wall in the western section of the site, which supported the upper section, this has subsequently been removed and the ground level lowered in this area to around 172mOD. The site then falls gently to the east to an elevation of 170mOD.

There is sharp fall in level on the eastern section of the site, which was defined by steps while the school was in operation, falling to a level of around 160mOD. This section of site is lower than the surrounding ground to the east, north and south.

Photographs showing the site are presented in Appendix A.

2.2 Geology

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

- 1st Edition geology plan at a scale of 1:10,560,
- Later edition dated 1977, at a scale of 1:10,000,
- Geological memoirs, Reference 1,
- 1:50,000 scale plan, Sheet 121,
- Wrexham Applied geological mapping, Reference 2.

The 1:50,000 scale plan, Sheet 121, shows a fault crossing the site with the outcrop of the Main Coal seam to the west of the site. Between the fault and the seam sandstone bedrock is shown at surface, while to the east of the fault glacial till is shown at surface.

Reference 2 shows the Main Coal seam running into the fault north of the site. It also confirms the bedrock and glacial outcrop described above.

The 1st Edition plan confirms the location of the fault across the site to be at the change in level by the school steps, to the west of the fault the outcrop of the Main Coal seam is shown 250m from the site boundary, with the underlying Brassey seam further to the west. The

Main Coal seam is recorded as being worked at surface in this location with the Main rock (sandstone) above it. To the east of the fault the Main Coal seam is shown outcropping adjacent to the fault and would therefore be anticipated to be at shallow depth beneath this section of the site. A shaft is shown on the eastern section of the site.

The later edition at a scale of 1:10,000 shows the same geology, although the outcrop of the Main Coal seam is shown closer to the western site boundary.

Reference 1 records a shaft section immediately north of Hill Street and west of the road that leaves it in a northerly direction (NW of the site). This revealed the Main Coal seam at surface, which was 2.28m thick separated from the Bind Coal (0.70m) above by 0.60m of carbonaceous shales. Some 26m below the Main Coal the Wall and Bench seam was encountered. It also records the Main Coal being worked at surface in this area.

The fault has a recorded down throw of 20m to the west and the general strata dip in this area is in an easterly direction, typically around 5°, Reference 1.

2.3 Abandoned Mining

A Coal Authority report dated December 2013 has been obtained, the relevant findings are summarised below and the full report presented in Appendix B.

- The property is in the likely zone of influence from workings in three seams of coal at shallow to 120m depth,
- Within or within 20m of the site boundary of the property are 5 mine entrances,
- There is one claim for subsidence within 50m of the property; this is to the south of the site to the west of the fault.

The Coal Authority description of shallow is less than 30m. It recommended that technical advice should be sought before developing this site.

The report records that mine shaft 329346-080, which is on the eastern section of the site was drilled and grouted by means of three boreholes in April/May 1973. A total of 15 tonnes of grout being injected under pressure. In addition, the made ground in the vicinity of the shaft was stabilized by drilling 16 holes in a ring 7.5m diameter, into which 10 tons of grout were injected. While correspondence was on record regarding capping of the shaft the Coal Authority do not have any records of this work being carried out. No records of treatment exist for any other shafts.

Discussions with the Coal Authority indicated their records to show the shaft to be 28m deep, as proved by drilling works.

2.4 History

The history has been studied on various plans held in GSL archives.

An 1850's Public Health plan at a scale of 1:500 shows the site to be occupied by National Schools, with a church to the west of the site and a large excavation on the eastern section of the site. The access to the site was from Hill Street, which was fronted by housing, see Figure 3.

The school buildings were on the central northern section of the site and spot levels recorded elevations around 560'OD (170.7mOD) reducing to 557.5'OD (170mOD) on the boundary immediately west of the excavation. No Shafts are shown on or close to the site.

The ground elevation by the top of the excavation was 552.7OD (168.5mOD) in the west reducing to 549'OD (167.3mOD) on the eastern boundary. A path entered the quarry and one crossed it, suggesting that quarrying was complete. The level at the lowest point was 522.1'OD (159.17mOD) showing that around 9.5m had been excavated.

The 1873 OS plan at a scale of 1:2,500 shows a similar scenario, although the path across the quarry is no longer shown.

By the 1900 OS plan the quarry had been largely backfilled.

The only other plan in GSL archives was dated 1962 and shows the quarry to have been completely backfilled and the school (now called Rhos Junior Controlled School) had been expanded with a building present on the eastern section of the site.

3.0 ENVIRONMENTAL SEARCHES

A GroundSure report dated November 2011 has been provided by the client, the relevant points from which are summarised below and the report presented in detail in Appendix C.

Historical Industrial Sites

- No potentially contaminative land uses identified on site,
- Eleven vehicle repair and garages identified within 50m of the site, these relate to the same garage on different periods of mapping.

Environmental Permits, Incidents and Registers

- None Recorded.

Landfill and other Waste Sites

- None within 250m.

Current Land Uses

- One industrial use within 50m, this is P & G Motors Ltd some 24m north of the site.

Hydrogeology and Hydrology

- No water abstractions within 250m,
- Not in a source protection zone, no nearby water courses.

The superficial deposits are designated as unproductive strata, while the underlying bedrock is designated a Secondary A aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

Designated Environmentally Sensitive Sites.

- None within 250m.

Natural Hazards

- The site is in an area where between 5 and 10% of properties are above the action level,
- Basic radon protection measures are required.

4.0 PROPOSED DEVELOPMENT

Beech Developments (BD) proposes to build fifteen traditional two storey houses on the site of the old Wern School in Rhosllanerchrugog to the west of Wrexham Town centre. Most of the houses are semi detached although there are several detached houses. The current proposed site layout is presented in Figure 4. An area of public open space is proposed in the north east corner of the site.

The proposed floor slab levels, existing ground levels and any cut/fill required are presented in the table below.

Plot	Floor slab level mOD	Ground level mOD	Cut (m)
1	172.0	173.5	1.5
2	172.0	173.5	1.5
3	172.2	174	1.8
4	172.2	173-174	0.8-1.8
5	172.4	173-174.4	0.6-2.0
6	172.2	172.0	
7	171.44	172.0	0.56
8	171.3	170.5	
9	170.4	170.5	
10	170.05	170.5	
11	170.05	170.5	
12	169.7	170.2	
13	166.11	166.0	
14	165.8	165.96	
15	165.8	165.96	

The ground level at the back of Plots 1 to 5 has already been lowered. At the back of the properties it is proposed to construct a 2m wide patio area bounded by a low retaining wall. The garden areas will then be made up with around 800m of imported material. A further small retaining wall is then proposed close to the site boundary.

The foundation loads are not known at this stage, however, based on experience of similar developments they are not anticipated to exceed 50kN/m run, with floor slab loadings not exceeding 5kN/m². The recommendations given in this report are based on these assumptions and should be reviewed and if necessarily revised during the detailed design process.

5.0 THE INVESTIGATION

5.1 Previous Investigation

A mining investigation at the site was located on the BGS web site.

This showed that the shaft had been searched for and located in 1972 by South Lanes Boring of Wigan. In addition, in 1973 the same company drilled five boreholes on the upper section of the site to determine the depth to any shallow abandoned mine workings.

The location of these boreholes is presented on Figure 5 and the logs in Appendix D. These boreholes proved the depth to the Main Coal Seam.

5.2 This Investigation

This investigation comprised:

- Three rotary percussive boreholes drilled to a maximum depth of 23.60m,
- Nine machine dug trial pits excavated to a maximum depth of 4.60m,
- Excavation to search for the mine shafts.

Prior to undertaking the investigation permission to search and treat mine workings was obtained from the Coal Authority; this permission is presented in Appendix B.

The drilling was undertaken by Pennine Drilling and Grouting, while Harvey Plant hire provided a 13T excavator for the trial pits and the shaft excavation/search.

The work was supervised on a full time basis by a chartered geologist from GSL who logged the boreholes and trial pits in general accordance with BS 5930, Reference 3. In addition, samples were taken for chemical and physical testing. The chemical samples were taken to the laboratories of Alcontrol in Chester, with the physical testing being undertaken by Geotechnics Ltd, also of Chester.

The locations of the boreholes and trial pits are presented on Figure 5 and their logs presented in Appendix E.

The following testing was carried out.

Physical Testing (Geotechnics Ltd)

- Moisture content,
- Atterberg limits.

The tests were carried out in accordance with BS 1377, Reference 4. They are discussed below in Section 6 and presented in full in Appendix F.

Chemical Testing (Alcontrol)

CLEA Contaminants – Arsenic (As), Cadmium (Cd), Mercury (Hg), Nickel (Ni), Lead (Pb), Selenium (Se), Phenol.

GAC Contaminants – Boron (B), Copper (Cu), Zinc (Zn), Chromium total (Cr), PAH (Speciation),

Other Contaminants

Sulphide, Sulphate (wat sol), Cyanide total, pH, Sulphur total, Total Organic Matter.

In addition, a WAC analysis was carried out on a stockpile of spoil that will need to be taken of site to tip. The results are summarised in Section 8 and presented in full in Appendix G.

6.0 GROUND CONDITIONS

6.1 Summary of Ground Conditions

The ground conditions from all of the investigations on site are summarised in the table below (the boreholes in brackets are from the previous investigation):

BH/TP	Made Ground (m)	Glacial Till (m)	Rock Cover (m)	Workings/Coal
BH 1	0-2.50		2.50-20.4 (17.9)	20.4-21.0
BH 2	0-5.40	5.40-10.2	10.2-15.80 (4.60)	15.80-16.0
BH 3	0-2.0			
BH (2)	0-2.60	2.60-3.7	3.7-20 (16.3)	20-20.4
BH (3)	0-1.20	1.20-3.7	3.7-20.6 (16.9)	20.6-21.3
BH (4)		0-2.40	2.4-18.9 (16.5)	18.9-20.4
BH (5)		0-2.40	2.4-23.8	
TP 1	0<4.60			
TP 2	0-1.70	1.70-2.40	2.40-2.95	
TP 3	0-3.90			
TP 4	0-2.95			
TP 5	0-0.70	0.70-1.50		
TP 6	0-0.35	0.35-1.75	1.75-2.10	
TP 7	0-1.20	1.20-2.90		
TP 8	0-1.40	1.40-2.80		
TP 9	0-2.25	2.25-2.90	2.90-3.00	

A cross section through the site is presented on Figure 6.

6.2 Made Ground

Most of the site is covered by a thin veneer of tarmac overlying sub base.

On the eastern section of the site the shaft cap was encountered at a depth of 1.05m, which was covered with granular sub base material.

The underlying made ground was described as soft to firm, brown, slightly sandy, slightly gravelly clay, with pockets of black ash and occasional bricks. This quickly gave way to loose, black, silty, gravelly sand of ash, with fragments of ceramic, glass and bone, locally becoming clayey.

It is considered that the eastern section of the site was used as a tip following opencast working of the Main Coal seam, see Figure 3. It is likely that two phases of tipping occurred, the ash representing an earlier tip and the clay probably being placed as a separating layer when the school was built.

On the upper western section of the site the made ground generally comprised colliery spoil derived from underground mine workings. It was described as loose, dark grey, sandy,

angular, fine to coarse gravel of mudstone, with occasional cobbles, coal fragments and fragments of burnt shale

6.3 Glacial Till

The till was described as firm, locally stiff, brown mottled orange brown, slightly sandy, slightly gravelly clay.

Atterberg limit testing revealed liquid limits between 29 and 35%, plastic limits between 17 and 19%, with plasticity indices of between 12 and 16%, indicating clay of low plasticity. The natural moisture content of the glacial till ranged between 16.8 and 19.6%, see Appendix F.

6.4 Bedrock

In TP 2 and TP 6 sandstone bedrock was encountered, which was described as moderately weak to moderately strong, brown mottled orange brown, very thinly bedded, fine grained sandstone, with thin siltstone laminations.

On the eastern section of the site the boreholes encountered sandstone and siltstone near surface, with mudstones encountered at depths of 14.20 and 16m.

BH 3 drilled to the west of the fault encountered sandstone and siltstone to a depth of 12m whereby mudstone was encountered to 20m where 2m of coal and possible workings were encountered, at the horizon of the Main Coal Seam.

The previous boreholes described the rock above the Main Coal as mainly siltstone, while in BH 3 it was described as sandstone overlying mudstone.

6.5 Groundwater

No groundwater was encountered in any of the boreholes or trial pits.

6.6 Mine Shaft Cap Construction

The shaft cap was found to be some 600mm thick with visqueen at its base resting on 100 to 200m of concrete blinding. It was 9.15m².

7.0 RESULTS OF CHEMICAL TESTING

The extent of testing was limited to five samples, two from the lower eastern section of the site and three from the higher western section of the site. In addition, a sample was taken of the colliery spoil excavated from the western end of the site which has to go off site; this was subject to a WAC analysis.

The results of the soil analyses are presented below where they compared to human health critical values (CVs) for initial screening purposes. The CVs adopted are for residential use. They are taken primarily from CLEA Soil Guideline Values (SGVs) published by the Environment Agency (2009), and LQM/CIEH Generic Assessment Criteria (GACs-2nd edition 2009). These criteria are derived using the CLEA v1.04 model under a standard default residential land use scenario, assuming that the potentially contaminated soil is present in gardens and beneath houses, and assuming worst case soil organic matter levels where these affect the critical value.

Where published human health critical values are unavailable or inappropriate, then other widely-used screening values are used, as noted below. Results are summarised below and attached in full in Appendix G.

CLEA SGV Contaminants

Determinant	No of Soil Tests	Range (mg/kg) (Mean)	CLEA SGV Guidelines A*		% exceeding CLEA SGV
Arsenic	5	7.06 – 16.9 (12.8)	1	32	0
Cadmium	5	0.32 – 4.2 (2)	1	10	0
Lead	5	28.6 – 373 (172)	1	450	0
Mercury	5	<0.14*	1	1	0
Nickel	5	10.1 – 56 (33)	1	130	0
Selenium	5	<1-1.84 (1.25)	1	350	0
Phenol	5	<0.01*	1	420	0
Notes					
A* 1 SGV for residential use.					
* - mean value not applicable since all or most values below laboratory detection levels					

No values exceeded the SGV for residential use.

GAC Contaminants

Determinant (GAC Metals)	No of Tests	Range (Mean) (mg/kg)	GAC Value (mg/kg)	% exceeding GAC
Zinc	5	43 – 1960 (734)	3750	0
Boron	5	2.09-33.7 (9.8)	291	0
Chromium	5	7.38 – 16.9 (14.7)	3,000 Cr III 4.3 Cr VI	0
Copper	5	33 – 111 (57.5)	2330	0

None of the above values exceed the relevant guidelines.

PAH Speciation

Determinant (GAC Speciated PAH)	No of Tests	Range (ug/kg)	GAC Value (mg/kg)	% exceeding GAC
Anthracene	5	<16 – 270	2300	0
Acenaphthylene	5	<12 – 49.5	170	0
Acenaphthene	5	<8 – 50.4	210	0
Benz(a)anthracene	5	18.8 – 582	3.1	0
Benzo(a)pyrene	5	<15 – 283	0.83	0
Benzo(b)fluoranthene	5	41.9 – 463	5.6	0
Benzo(ghi)perylene	5	30.8 – 495	44	0
Benzo(k)fluoranthene	5	<14 – 87.4	8.5	0
Chrysene	5	25 – 608	6	0
Dibenzo(ah)anthracene	5	<23 – 75.6	0.76	0
Fluoranthene	5	41.3 – 563	260	0
Fluorene	5	<10 – 55.6	160	0
Indeno(123cd)pyrene	5	<18 – 104	3.2	0
Naphthalene	5	75.2– 452	1.5	0
Phenanthrene	5	133 – 1650	92	0
Pyrene	5	31 – 726	560	0
Total	5	411-6460		

The above guidance values are based on a worst case SOM of 1%. No values exceeded the GAC values for residential use.

Other Contaminants

Determinant	No of Tests	Range (Mean) (mg/kg)	Published Guidelines
Sulphide	5	<15	1000 (ICRCL)
Sulphur	5	<10-51.2 (19.3)	0.5% (UU)
Sulphate (wat sol)	3	0.0176-0.057	N/A
Total Cyanide	5	<1	NA
pH	5	7.25 – 8.42 (8.07)	<5 (UU)
Total organic Carbon	5	0.72 – 31.6 (12.9)	6% (EA)
Notes. UU United Utilities EA Environment Agency			

8.0 MINING RISK ASSESSMENT

8.1 Risk Assessment

When assessing the risk of shallow mining to a development several issues need to be considered, such as the type of working, depth to workings etc.

There are two types of mining, partial and total extraction. Methods of partial extraction are nearly all variations of, "Pillar and Stall" techniques, with pillars of coal being left to support the roof of the mine. Extraction ratios of between 30 to 75% were typical, depending on geological conditions and depths. However, it was common practice to work pillars on withdrawal from the mine, so higher extraction ratios may have been possible.

Total extraction is achieved by long wall working and also by various pillar and stall techniques, where the pillars were removed in a second phase of mining, normally on retreat from the mine.

It is important to know the method of mining employed, as total extraction methods normally result in total collapse of the workings, with the exception of the main roadways. While partial abstraction techniques leave voids in the mine, which can become unstable and migrate to surface. These take the form of "crown holes" at surface, which are generally circular and can be several metres in diameter.

No detailed mine plans showing the method of working have survived, if mined this strata would have been mined prior to 1872 when it became legal to deposit mine plans. Due to the age of the mining and the proximity to outcrop, it must be assumed that it would have been by pillar and stall techniques and potential for voids may exist.

No detailed research into mining subsidence in North Wales has been undertaken. However, extensive research has been carried out in South Wales, where similar pillar and stall mining has taken place, Reference 5. This research revealed:

- Almost all incidents are "crown holes" in form, delayed general subsidence is very rare,
- About 75% of subsidence incidents are caused by the collapse of mine entrances or workings close to outcrop,
- Mine entrances present the greatest risk and account for over 50% of recorded incidents,
- The recorded rate of occurrence is very low.

The remaining subsidence incidents were analysed for their migration ratio (H/T), where H is the thickness of rock above the workings and T is the typical seam/void thickness, taken here as 2m, the height of a typical roadway. Of these 75% of the incidents had an H/T ratio of less than 2 (4m rock cover), with 90% of incidents having an H/T ratio of less than 6 (12m rock cover). The majority of the remaining incidents were related to special events, probably

relating to collapses on main roadways, which would have continually been cleared by miners leading to bigger residual voidage.

There is also strong evidence from data gathered from grouting contracts, opencast sites and site investigations that migration of voids above workings generally extends to a limited height above the original void. Records of over 10,000 drill and grout boreholes were collected, in almost every case, the record of broken ground, workings or voids, occurred at or immediately above the anticipated elevation of the worked horizon.

From the above it can be concluded that the majority of residual voids have already collapsed to a stable profile. Otherwise voids would be encountered at a wide range of depths as they progress to the surface.

To assess the risk from shallow abandoned mining the following risk based approach is followed, where risk (R) may be defined as:-

$$R = F \times C$$

Where F is the frequency of an undesirable event and C is the consequences of it happening.

The assessment of risk due to mining subsidence is a twofold process, involving first the assessment of probability of a subsidence event happening, i.e. the subsidence potential; secondly the consequences resulting from that event. For a crown hole to occur, the following must coincide at any one point:

- There must be a potential for mining (PM),
- There must be workings under the site (PW),
- A void must remain in the workings (PV),
- The void must be unstable and able to migrate to surface (PI),
- The thickness of rock overburden must be insufficient to choke the collapse feature before hitting rock head (PR),
- The thickness of drift must be insufficient to prevent the void reaching the surface (PD).

PW Workings Exist

Western Section

Mine workings in the Main Coal seam beneath the site have been proved at a depth of 19.50m in BH 2 on the western side of the site, increasing to 19.5m in the central section of the site. Calculation of the dip of the strata from Figure 6 confirms it to be 6° in an easterly direction. As the seam approaches the fault it gets deeper and would have been expected to be highly disturbed, which would have prevented mining close to the western side of the fault.

Eastern Section

The desk study and site investigation have proven the Main Coal seam to have been extracted by opencast methods at surface over the eastern section of the site, therefore removing any risk from shallow abandoned workings in this coal seam. It is also possible based on the depth of excavation that some clay was also worked from this pit, possibly for brickmaking.

The two boreholes have proved a coal seam at a depth of 15.5m increasing to 20m beneath this section of the site. The dip on this side of the fault appears steeper and this is due to movement of the fault dragging the strata. Consequently, mining would not have been pursued close to the fault. This seam is likely to be a minor seam between the Main Coal seam and the next seam the Wall and Bench. The depth from rock head in BH 1 and the base of the shaft is 26m, which coincides perfectly with the shaft section discussed in Section 2.3. While it is possible this seam was worked the Wall and Bench coal seam would certainly have been worked beneath the site.

PV Voids remain in Workings

The boreholes have shown that the workings themselves have been completely backfilled/collapsed. This was typical and was undertaken to avoid having to bring waste to surface. However, old roadways could exist beneath the site, as these were typically the only well constructed part of the workings, as they provided access to the mine. The height of a roadway would typically be 2m.

PI Voids become unstable

The potential for voids to become unstable has to be considered, although the depth to any potential workings would ensure that any voids were soon be "choked" by material collapsing into the void, therefore preventing any further upward migration. In addition, all of the boreholes on the western side of the site (5 No) proved the seam at its anticipated depth, with no evidence of upward migration.

PR Rock cover insufficient to prevent migration of rock Western Side

The site investigation has indicated that the rock cover above the seam is some 16m in the west increasing to 17.5m in the central section of the site. Given a starting void height of around 2m, this would give an H/T ratio of between 8 and 8.75. Consequently, the risk of upward migration of any residual voidage reaching surface is considered to be very low. In addition, immediately west of the fault the chances of upward migration of the Main Coal seam are considered to be negligible for the reasons discussed above.

The rock cover above the Main Coal seam is recorded as sandstone, which is a competent rock, which will also help preclude any upward migration towards surface.

Eastern Side

On the eastern side of the fault the rock cover to the shallowest seam varies between 5.5 and 17.5m, giving an H/T ratio of between 2.75 and 8.75. However, to the Wall and Bench an H/T ratio of 13 is anticipated. Therefore on this side of the fault, while the risk is still considered to be low, it is slightly higher than the east side of the fault. This is discussed in more detail in Section 9.0.

PD Drift cover insufficient to prevent migration to surface

The site investigation has revealed that there is a thin cover of glacial till over most of the western side of the site. Therefore any ameliorating affect on any upward migration of voids through the till has been discounted.

8.2 Conclusions and Recommendations

Shafts

The desk study and site investigation have proved the shaft in the eastern section of the site to have been grouted and capped.

However, the shaft cap has not been founded at rock head and is actually sat on loose fill. Therefore despite the fact that the shaft has also been grouted the possibility of the shaft fill failing and causing the shaft cap to move cannot be entirely discounted, although the risks are deemed to be low. This is discussed in more detail in Section 9.0.

The shaft on the northern section of the site by the access road was searched for by excavating to the top of the glacial till. However, the search was limited by the adjacent properties and this shaft was not located.

However, it should be stressed that in an area of such intensive past coalmining undertaken several hundred years ago, that the possibility of encountering un recorded shafts cannot be discounted. If encountered, they will need to be treated in accordance with current good practice, which should be agreed with the Coal Authority in advance of any works being carried out.

Shallow Mining

As can be seen from the above discussion, while the site has been undermined the risks to the proposed development are considered to be very low to negligible. This is based on the fact that that workings were backfilled/collapsed and no evidence of upward migration was encountered. In addition, the only residual voidage that could remain is old roadways, with sufficient rock/superficial cover being present to choke any potential void, i.e. a 2m void in the shallowest seam would be filled with debris, which will bulk in size and therefore choke the void before it can migrate to surface.

It can therefore be seen from the above assessment that the risk to the surface from crown hole collapse is considered to be very low. Therefore it is not considered necessary to drill and grout beneath the proposed structure.

To address the remaining very low risk, recommendations are given in Section 9.0 below.

9.0 GEOTECHNICAL RECOMMENDATIONS

9.1 Excavations and Site Preparation

The site preparation has largely been carried out with all of the buildings demolished and the resulting material crushed on site. However, there is still the possibility for old obstructions in the form of foundations being encountered during site works. Where they interfere with new foundations and floor slabs they will need to be broken out using pneumatic/hydraulic breakers to remove potential hard spots beneath the development.

Elsewhere excavations will be in made ground and glacial till and will be possible using conventional earthmoving equipment. Any deep excavations for services on the western section of the site may encounter bedrock, which may prove difficult to excavate and which may need to be broken out.

Excavations deeper than 1.20m will need to be either shored or battered back for safety reasons.

Groundwater seepages are not anticipated, if encountered they should be slight and easily catered for by pumping from sumps cut within the excavation.

9.2 Foundations and Floor Slabs

For Plots 1 to 12 following the reduction in ground level all plots should have glacial till at or close to surface. Consequently, conventional strip foundations can be used founded in the underlying clay of at least firm to stiff consistency, where an allowable bearing pressure of 100kN/m² can be used to proportion the foundations. However, a conventional 600mm wide bucket should be sufficient. It should be noted that the upper parts of the excavation will be in colliery spoil and some over break may occur.

The foundations should extend a minimum depth of 900mm below final external ground levels and at least 200mm into the underlying clay. Due to the likely thickness of made ground beneath the plots suspended slabs will be required, either cast in situ or constructed as beam and block. This technique would be preferable, as it will enable the passive radon gas protection measures to have a void beneath the slab which can be vented to atmosphere using telescopic air vents.

To address the low risk of damage to the structure from ground movements due to the old mine workings, it is recommended that for Plots 1 to 9 the strips be lightly reinforced top and bottom, say with a A393 mesh. For plots 10 to 12 the depth of the workings have increased sufficiently and are close enough to the fault to enable the reinforcement to be omitted. However, Plots 13 to 15 are within the backfilled opencast, which has proved to be bowl shaped and up to 9.5m deep at its deepest point, see Figure 5.

Plot 13 is directly above the cap for the old shaft, which would have had its top section and liner removed during the open casting. While it is possible to build on shafts it would be preferable to have them engineered to the highest possible standard, that is with the cap founded directly on bedrock. This is not the case at this shaft and it would therefore be very difficult from an insurance and selling perspective to construct this house at this location. As discussed above the risk of failure still exists which could cause substantial ground movements. It is therefore recommended that its location be moved westwards away from the cap. The present excavation for the cap can then be backfilled with inert clay derived from foundation excavations in the glacial till.

The made ground is considered unsuitable for traditional spread foundations due to its weak strength, variability and difference in thickness.

Several options were considered for these plots and these are discussed below:

Piling

All types of piling would be considered feasible at this site. The main disadvantage is the possibility of mine workings at depth, which should ground movements occur would cause failure of the piles. To consider using piles they would have to be bored piles taken below the coal seam below and would also require grouting of any workings, which would be exceeding expensive for three plots.

Ground Treatment

There are several types of ground treatment such as vibro stone columns or concrete columns that would be suitable.

Preferred Option

The most suitable option both technically and cost effectively would be to found the buildings on a granular raft. This would involve excavating the existing made ground for a depth of at least 1m below the base of the proposed foundations and for a distance of 1m outside the building line. This material should then be replaced with suitable imported granular material, such as a 6F2, which should be well compacted in accordance with an approved earthworks specification.

The house foundations should then comprise raft foundations designed to span any potential collapse of 3m and cantilever 1.5m at its edge.

Alternative Solution

Based on the above discussion, it is recommended that Plot 13 be moved. If this is possible, it would also make sense to move Plots 14 and 15 as well. These three plots could be moved to the upper area in the proposed area of the public open space, with this area being re located to the eastern section of the site. This has the advantage in that strip foundations could be used

for these plots and the need to build the access road to the eastern section of the site is no longer required.

9.3 Access Road

No California Bearing Ratio tests (CBR's) were carried out as part of this investigation. For preliminary costing purposes a CBR value of 3% can be assumed in the glacial till of at least firm consistency. However, it is likely that most of the road will be underlain by colliery spoil which is mainly granular in nature. This material can be excavated and recompacted to form a capping layer if required, with CBR values in excess of 10%. The final road construction will however depend on whether the road is to be adopted and what requirements the adopting authority have.

9.4 Protection of Buried Concrete

Chemical testing has indicated that chemical attack of buried concrete is not an issue and concrete can be designed as the following classes, Reference 6.

- DS – 1,
- ACEC – 1.

9.5 Landfill and Radon Gas

The desk study has failed to reveal any nearby landfills; therefore landfill gas is not an issue. However, the work has revealed a backfilled excavation on site which has been backfilled with inert materials.

The desk study has also indicated that basic radon protection measures will be required, which should comprise as a minimum a 1200 gauge polythene layer extending through the construction and cavity trays, with the sheets lapped and taped in accordance with current good guidance, Reference 7. In addition, all service entries beneath the building will need to be sealed using proprietary "Top Hats" etc.

9.6 Environmental Issues

The desk study has failed to reveal any past contaminative uses on the site, although the area has been used extensively for coal mining, with the eastern section of the site opencasted for coal and subsequently backfilled.

The site investigation failed to reveal any visual or olfactory evidence of contamination and the testing of the made ground across the site confirmed no contamination of concern being present.

The site is therefore considered to be uncontaminated, however, in accordance with current good practice a watching brief should be kept on all excavations. Should any contaminated material be encountered it should be excavated, stored safely on site and samples taken for testing so it can be taken off site to an appropriately licensed landfill facility.

In addition, the WAC analysis of the excavated colliery spoil from the western end of the site has indicated it to be inert and can be taken to an appropriately licensed landfill. However, if permission is obtained to move the public open space to the eastern section of the site, this material can be used to raise the levels in this area.

REFERENCES

1. Geology of the Country around Wrexham, Memoirs of the Geological Society, 1928,
2. Applied Geological Mapping in the Wrexham Area: Geology and Land use Planning: Technical Report WA/91/4
3. BS 5930, 1999, Code of Practice for Site Investigation,
4. BS 1377, 1991, British Standard Methods of Tests for Soils for Civil engineering Purposes,
5. Scott M J and Statham I, Development advice maps: mining subsidence, Geohazards in Engineering Geology, Engineering Geology Special Publications, 15, pp 391-400.
6. BRE Special Digest 1, 2005, Concrete in Aggressive Ground,
7. BRE 1999, Radon: guidance on protective measures for new dwellings.

FIGURES



SCALE - 1 : 50000

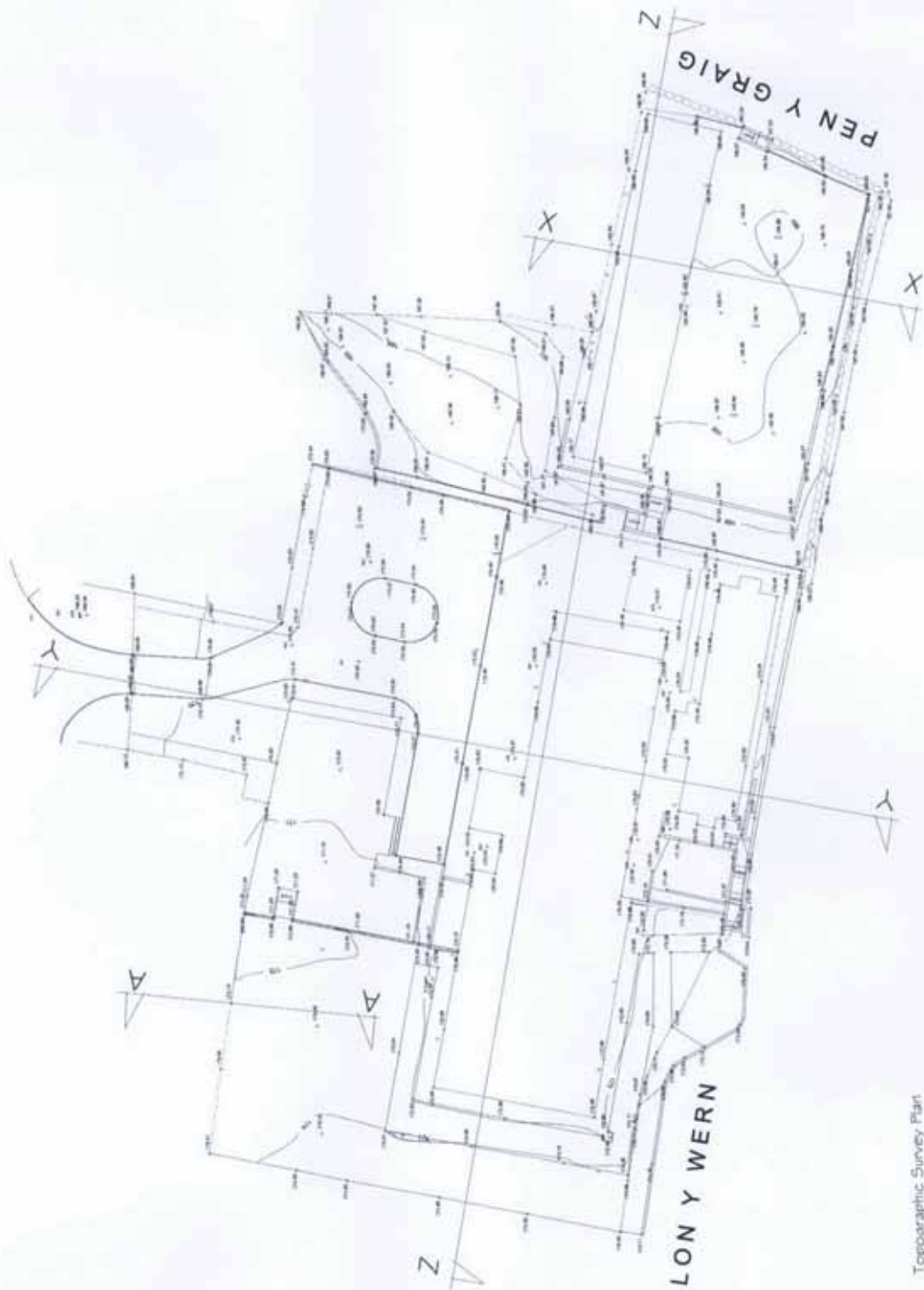
LICENSE No. 100030802

SITE LOCATION

FIGURE **1**



HILL STREET

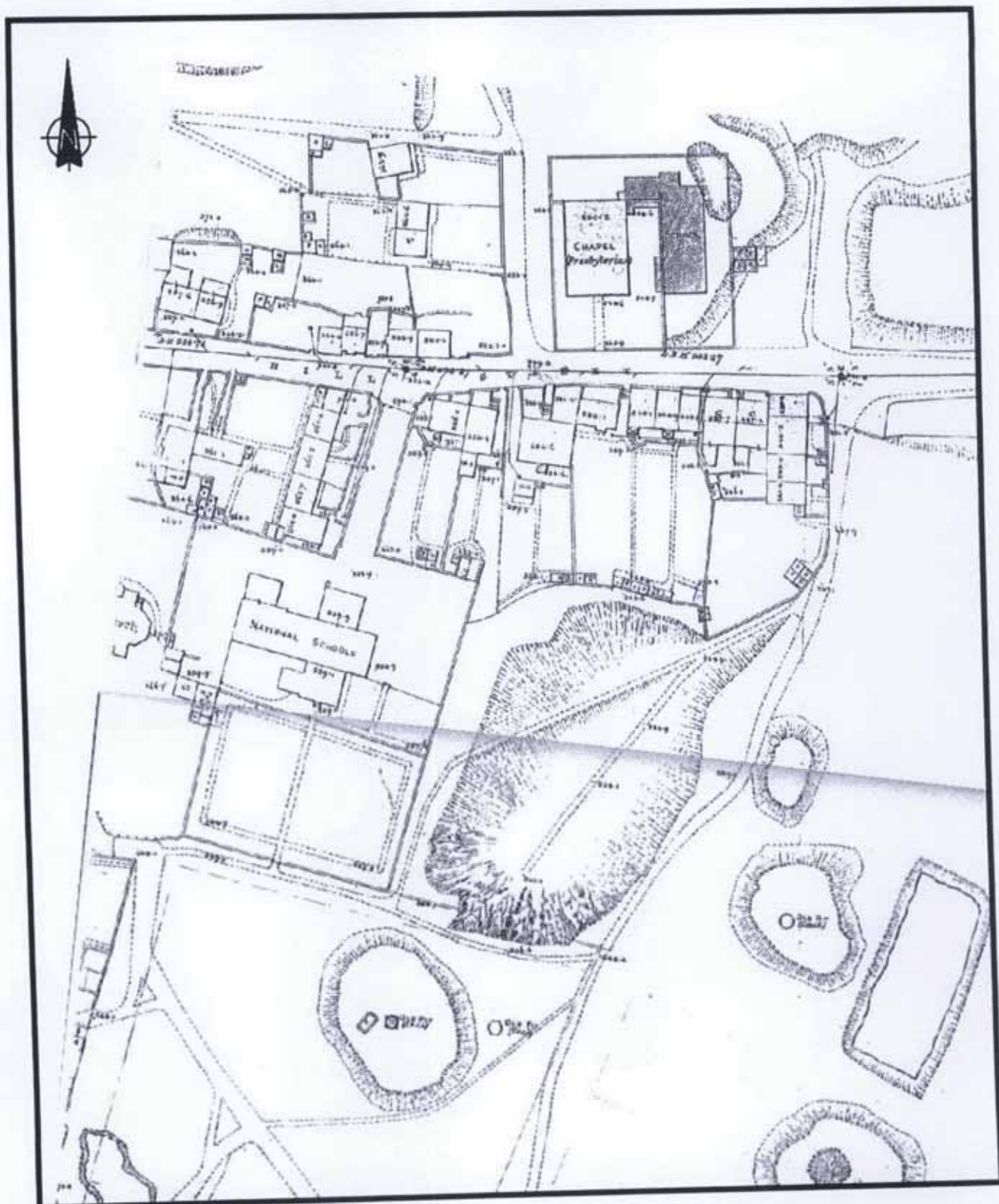


SCALE 1:500

Topographic Survey Plan

**EXISTING
SITE LAYOUT**

FIGURE 2



SCALE - 1 : 2500 approx

HISTORY

FIGURE **3**



SCALE 1:500

**PROPOSED
LAYOUT**



LEGEND

BH1



BOREHOLE
(previous investigation)

TP1



TRIAL PIT LOCATION
(this investigation)

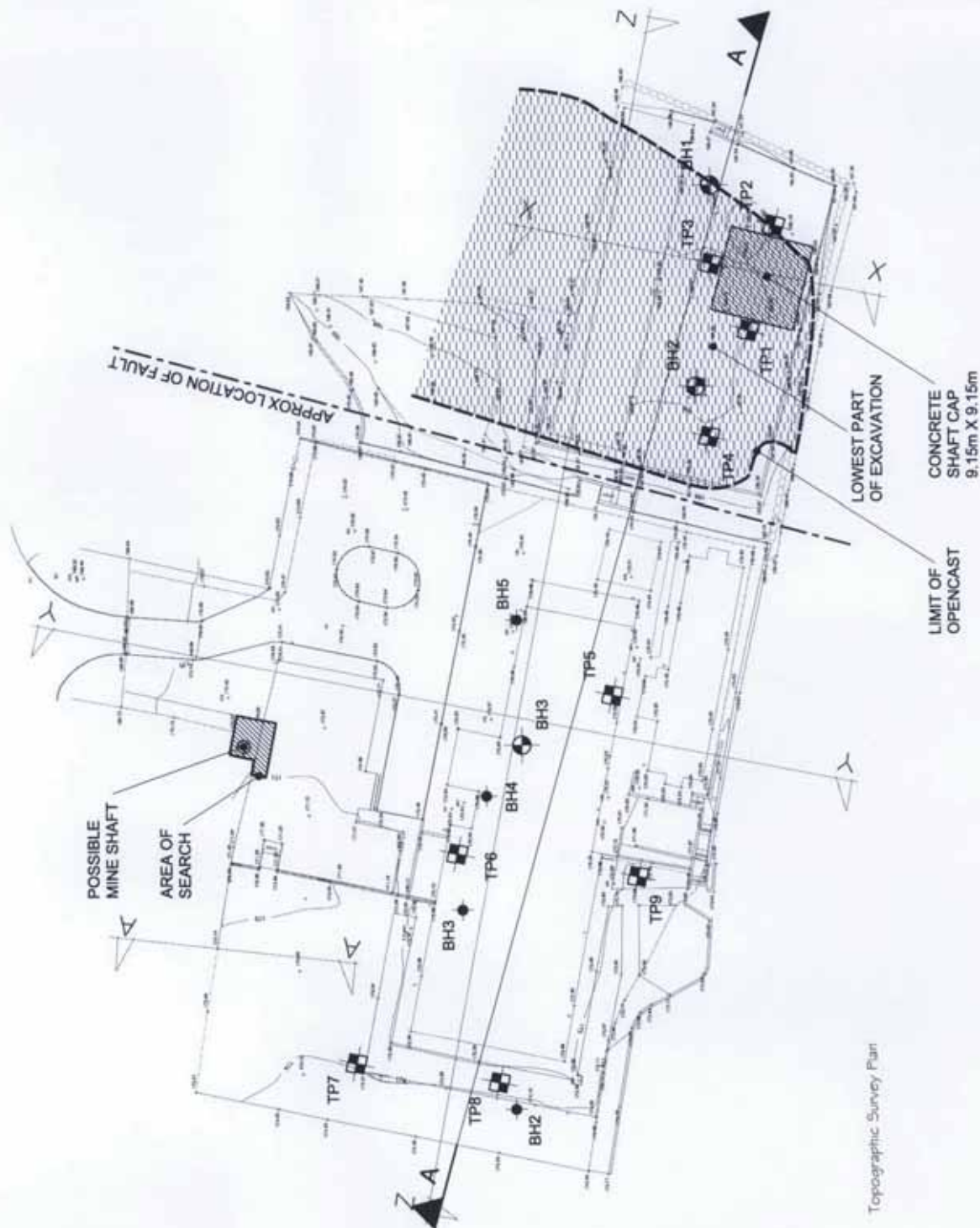
BH1



BOREHOLE LOCATION
(this investigation)

X X X

SECTION A - A
(see Figure 6)



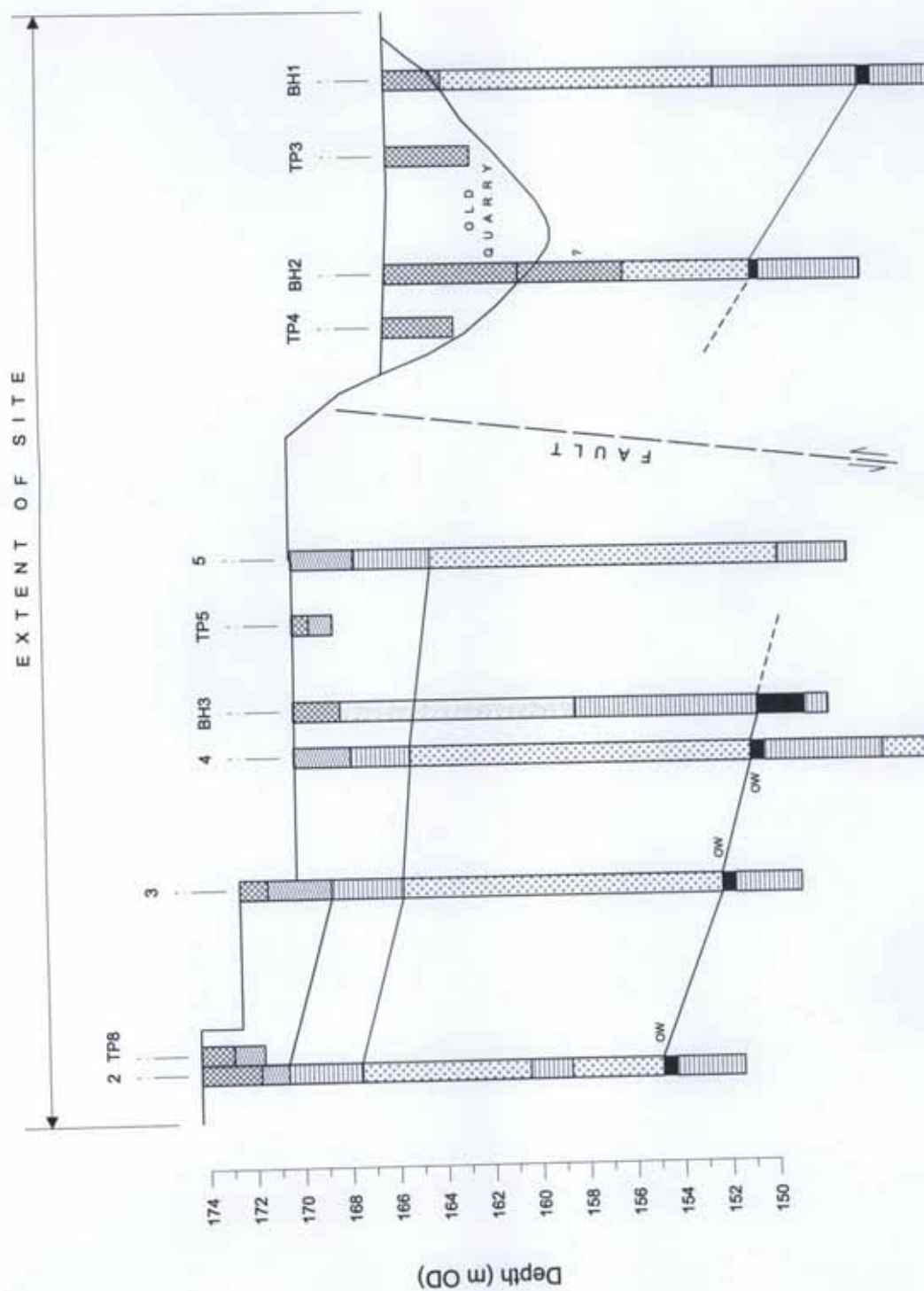
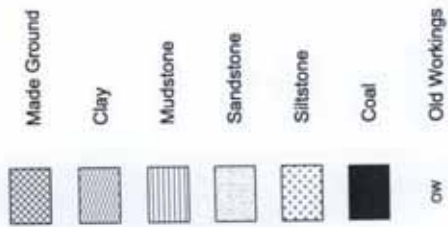
Topographic Survey Plan

SCALE 1:500

EXPLORATORY HOLE
LAYOUT AND GROUND
CONSTRAINTS

FIGURE
5

Legend



Section A - A

Depth of Shaft

Scale : 1:500 Horiz
1:200 Vert

GEOLOGICAL CROSS SECTION

FIGURE 6

APPENDIX A

Site Photographs



Photograph 1 Showing reduced ground levels along western site boundary, looking south



Photograph 2: Western site boundary looking north



Photograph 3 Showing lower eastern section of the site



Photograph 4 showing shaft excavations on lower section of site



Photograph 5 Showing reinforcement in cap



Photograph 6 Showing shaft cap



Photograph 7 Showing Site entrance off Hill Street



Photograph 8 Showing main section of site looking west

APPENDIX B

Coal Authority Report and Permissions

Issued by:
The Coal Authority, Mining Reports Office, 200 Lichfield Lane, Berry Hill, Mansfield, Nottinghamshire NG18 4RG
ON-Line Service: www.groundstability.com - Phone: 0845 762 6848 - DX 716176 MANSFIELD 5

HOPLEY PIERCE & BIRD SOLICITORS,
DX 26659 WREXHAM

Person dealing with this matter:	Eric Fretwell
Our reference:	00071671-11
Your reference:	PR/H485/1
Electronic Ref:	EME_00016881560001_005
RRUID:	005.00016881560001
Date of your enquiry:	03 November 2011
Date we received your enquiry:	03 November 2011
Date of issue:	25 November 2011

This report is for the property described in the address below and the attached plan.

Non-Residential Coal and Brine Report

Ysgol Y Wern, Pentredwr, Rhosllanerchrugog, Wrexham, LL14 1DB

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.

Coal mining	Yes
Brine Compensation District	No

Information from the Coal Authority

Underground Coal Mining

Past

The property is in the likely zone of influence from workings in 3 seams of coal at shallow to 100m depth, and last worked in 1862.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

The property is not in an area for which a licence has been granted to remove coal using underground methods.

The property is not in an area that is likely to be affected at the surface from any planned future workings.

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

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

Within, or within 20 metres of, the boundary of the property there are 5 mine entries, the approximate positions of which are shown on the attached plan.

Coal Authority records disclose the following information:

329346-080. This entry was drilled and grouted by means of three boreholes within the shaft during April/May 1973. A total of 15 tons of PFA grout at a PFA/cement ratio of 9:1 was injected under pressure. Similarly the made ground in the vicinity of the shaft was stabilised by drilling 16 holes in a ring 7.5m diameter into which 10 Tons of grout were injected. In mid 1973 correspondence was ongoing between the NCB and the Denbighshire Council regarding the specification for capping of the shaft but it is unknown if this was carried out.

329346-281. No treatment details.

329346-280. No treatment details.

329346-279. No treatment details.

329346-278. No treatment details.

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

Coal-mining geology

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

Opencast Coal Mining

Past

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

Present

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

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

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.

Coal-mining subsidence

The Coal Authority has not received a damage notice or claim for the property since 31 October 1994. There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The 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

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

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.

Withdrawal of Support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working Facilities Orders

The property is not in an area for which 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.

Payments to Owners of Former Copyhold Land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Comments on Coal Authority information

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.

The attached plan shows the approximate location of the disused mine entry/entries referred to in this report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan. Property owners have the benefit of statutory protection (under the Coal Mining Subsidence act 1991*). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848 or online at www.coal.gov.uk/services/subsidence. If you wish to discuss the relevance of any of the information contained in this report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source plans from which the information has been taken these are normally available at our Mansfield office, free of charge, by prior appointment, telephone 01623 637233. Should you or your adviser wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an

emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

*Note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional remarks

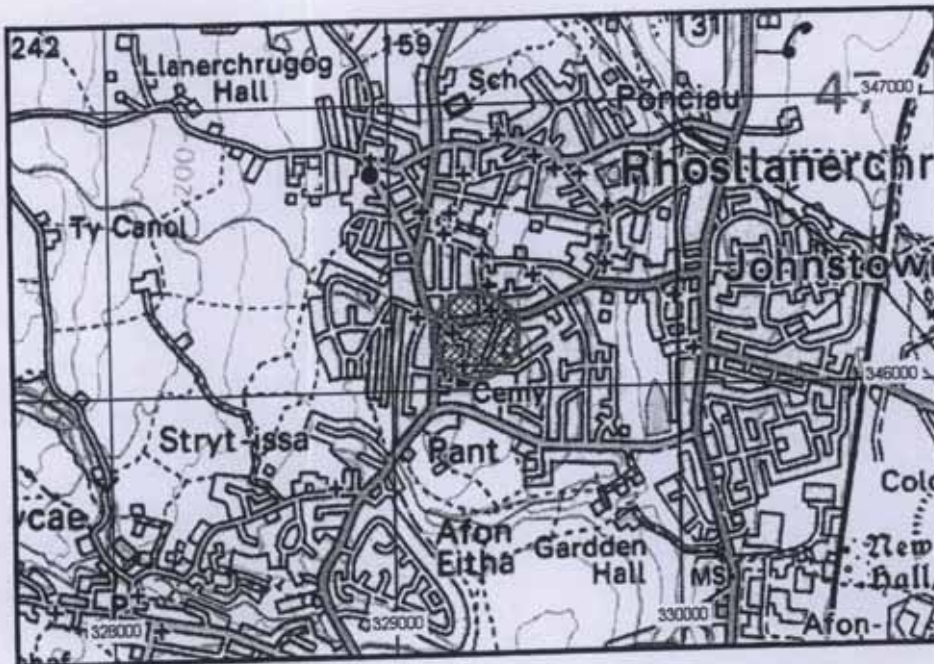
This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions 2006. The report is compliant with Home Information Pack requirements.

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Location map



Approximate
position
of property

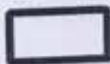


Enquiry boundary

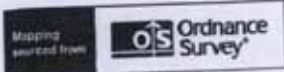
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Key

Approximate position of enquiry boundary shown



Disused Adit or Mineshaft



The COAL AUTHORITY



200 Lichfield Lane
Berry Hill
Mansfield
Nottinghamshire
NG18 4RG

*This matter is being dealt with by
Paul Heap, Tel: 01623 637154
E-Mail: paulheap@coal.gov.uk*

Tel: 01623 637000
Fax: 01623 620363
E-mail: permissions@coal.gov.uk

Our Ref: 7476

20th December 2012

Your Ref:

Groundsolve Ltd
Unit 7
Well House Barns
Chester Road
Bretton
CHESTER
CH4 0DH

For the attention of Mike Scott

Dear Sir

Ysgol Y Wern, Rhos, Wrexham

Application for Permission to Enter or Disturb Coal Authority Mining Interests

I refer to your application, on behalf of your client, for permission to enter the Coal Authority's mining property. Attached to this letter is the signed permit certificate and supporting documentation which allows you to carry out the works to the specifications in the documents you submitted within "the site", as shown on the plan which is part of the attached mining report.

You should be aware that mine gas may be present within voids in shallow mine workings, mine entries, voids above such workings and in any permeable strata or surface fill material. Consequently there is a risk of encountering mine gas within the proposed boreholes. Especially at times of falling barometric pressure, all boreholes and excavations should be regularly tested for all gases associated with coal mining, commonly carbon dioxide, methane and hydrogen sulphide.

If mine gas or mine water is encountered, would you ensure that such occurrences are documented and the appropriate actions are taken. Any surface construction must take account of the risks associated with building on land that may be susceptible to surface emissions of mine gases and mining related instability. Care should be taken to ensure any exposed coal seams and all boreholes and excavations are effectively sealed with a cement based material at the earliest opportunity to prevent continued ingress of air.

Care should be taken when investigating the mine entry and the appropriate safety measures should be employed. If the recorded or any unrecorded mine entries are encountered you are required to provide the Authority with the results of your investigations together with the proposed specification for any treatment, for comment, prior to treatment works commencing.

The accompanying permit certificate and supporting documentation should be copied to all interested parties, especially the site operatives, and be available for inspection on a site visit by the Authority or the HSE.

This permit certificate is issued on the understanding that, under no circumstances will works other than those specified, be carried out without the prior written approval of the Authority.

Please submit full details of all works undertaken as required by the Permissions terms and conditions, when the works are complete. At this time you will need to confirm if the Permission should remain in force. If you wish to discuss this or any other matter, please do not hesitate to contact me using the contact details above.

Please quote the Coal Authority Reference No.7476 on all future correspondence.

Yours faithfully



Paul Heap
Licensing & Permissions Manager

Permission to Enter or Disturb Coal Authority Mining Interests

Name and Address of Permit Holder:

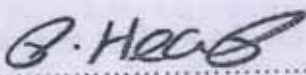
Beech Developments
24 Middle Road
Coedpoeth
WREXHAM
LL11 3TN

Site Location:

Ysgol Y Wern
Rhos
Wrexham

This certificate hereby grants the above named Permit Holder permission to carry out :-
*Investigation of shallow mine workings by 4 boreholes and investigation of mine entry
329346-080*

within the Authority's mining interests at the identified site location for the period of 12 months from the effective date shown below. The granting of this Permission does not constitute advice given by the Authority in relation to the proposed operations. It is the Applicant's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.

Signed:  Effective Date: 20/12/2012.....

For and on behalf of The Director of Operations at the Coal Authority

*Nominated Representative: Paul Heap, Licensing & Permissions Manager;
The Coal Authority, Licensing & Permits Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG
Tel: 01623 637339; E-Mail: permissions@coal.gov.uk*

THE COAL AUTHORITY

Terms and Conditions for Entering or Disturbing Coal Authority Mining Interests

Before permission can be given to enter or disturb Coal Authority mining interests, each applicant must agree with the following terms and conditions in support of their application and return a signed copy to the Coal Authority along with the original application and supporting documentation.

- 1) The Applicant will take all steps, including the erection and maintenance of fences and warning notices, necessary to prevent any person from accidentally entering, falling into, or interfering with any mine entry, mine working, mining collapse, excavation or borehole during the works and as a consequence of the work.
- 2) The Applicant will ensure that nothing is deposited, falls or flows into any mine entry, mine working, mining collapse, excavation or borehole which by itself, or in combination with anything else which may be or which might reasonably be expected to be, in or adjacent to any such mine entry, mine working, mining collapse, excavation or borehole, could block or weaken any underground excavations within or beyond the Site, or could cause or aggravate pollution of underground water, or could cause any nuisance or harm to persons or property on the surface or underground, including any mining operations.
- 3) The Applicant will ensure that appropriate equipment is available on the Site and that procedures are adopted to detect the emission of any flammable or noxious gas from any part of the Site, and will take appropriate action to protect members of the public and workmen. Furthermore, the Applicant will take all appropriate measures to prevent mine gasses migrating into neighbouring properties as a result of the works and where it is necessary to ensure public safety extend his gas monitoring regime to include offsite properties
- 4) The Applicant will notify the Authority's Surface Hazards Office, using the **24 hour Emergency Call Out Service on 01623-646333**, immediately there is evidence of spontaneous combustion of coal, uncontrolled emissions of mine gas or water or other hazard directly or indirectly caused by or related to the above mentioned activities both during and following completion of works. Furthermore, the Applicant will seek proper advice and take all necessary steps for the purpose of controlling, extinguishing and making safe any of the above mentioned hazards.
- 5) The Applicant will comply with all reasonable directions given by the Authority which the Authority in its absolute discretion believes is necessary to safeguard coal, mine workings, mine entries, the environment or public safety.
- 6) The Applicant will provide to the Authority and it's representatives all necessary facilities at all reasonable times to inspect the Site, and ensure that all permissions, consents and private or other rights are adequate to entitle the Authority or those authorised by it to gain access to the Site for any purpose connected with the carrying out of its statutory duties, powers and obligations. The Applicant will notify the Authority's Licensing & Permits Office at least **48 hours** prior to starting intrusive work on the Site and supply contact details of a nominated Site supervisor.
- 7) Should it be found necessary to significantly change the method of treatment, design or specification of the works from that contained in the application to the Authority, the prior permission of the Authority must be obtained before proceeding (such permission not to be unreasonably withheld).
- 8) The Applicant will take account of the possibility of unrecorded mine workings and unrecorded disused mine entries within the site.
- 9) The Applicant should be conversant with all current applicable legislation and will adopt appropriate practices and procedures for working and drilling in hazardous conditions associated with mine workings and mine entries and seek advice as necessary from suitably qualified persons. The Applicant should ensure that contractors are competent and have the necessary experience to enter mine workings.

- 10) Immediately on completion of each borehole it shall be temporarily plugged or sealed pending permanent sealing. Permanent sealing must be effected with a suitable cementitious based material. Such permanent sealing to be throughout the borehole to full depth, and to take place as soon as practicable, having regard to the proposals for site stabilisation.
- 11) A written report summarising the works carried out must be submitted to the Authority's nominated representative *within 3 months* of the completion of operations. The report must include details of all excavations, gas and water encountered, treatment and stabilisation work carried out (including engineering drawings) and grout takes. Included in the report must be a plan to a reasonable scale, showing salient surface features and correlated to Ordnance Survey national grid, showing all boreholes and excavations, and the positions of mine entries and voids proved by the works.
- 12) The Applicant shall, for a period from the date of commencement of the works to 12 years after completion of the works and receipt by the Authority of the report detailed at 11 above, indemnify the Authority against liability for claims, losses or damages, including those made under the Coal Mining Subsidence Act 1991 and claims by the Applicant, whether arising as a result of any failure by the Applicant or the Applicant's contractors, to comply with the requirements of this permission, or as a result of any act, failure, inadequacy, omission, negligence or default by the Applicant or the Applicant's contractors in designing or carrying out the works.
- 13) All costs incurred in compliance with this permission shall be borne by the Applicant.
- 14) For the avoidance of doubt, this permission does not confer upon the Applicant nor anyone acting on his behalf any right whatsoever to explore for coal, win and work coal, or to explore for coal mine or coal-bed methane. Where it is necessary to dig and carry away coal as part of the development, separate prior written permission must be sought from the Authority.
- 15) The Applicant will be responsible for obtaining any necessary permission under Town and Country Planning and any other relevant legislation, and for notifying statutory undertakers and other relevant bodies of his intentions, and for establishing and protecting the positions of any services on the Site.
- 16) The Applicant will obtain all necessary consents from surface and mineral owners, to obtain access to, and occupy the Site, and to carry out operations in any mine or mineral not vested in the Authority.
- 17) If at any time the Authority considers the Applicant to be in breach of any of the obligations or conditions of this document, the Authority may terminate this permission, with immediate effect, by oral or written notice at which time all activities interfering with the Authority's interest must cease.
- 18) Where in the Authority's opinion, the proximity of any mine entry to a proposed new development is likely to increase its liabilities, the Applicant agrees to take a formal conveyance of the mine entries. All such mine entries shall be fully stabilised by the Applicant prior to the conveyance. The conveyance will be on the Authority's standard terms and conditions for a nominal sum. The purchaser will also be required to make a single payment of £200 (regardless of the number of mine entries being conveyed), towards the Authority's legal and other costs.

I agree to the terms and conditions set out by the Coal Authority in relation to:

Site Location: YSGC 7 WEN
 Signed: [Signature] Date: 6/12/12
 (Please print clearly) E-mail: mike.scott@groundsource.com
 Name: M. J. Scott Telephone: 01244 661361
 Position: Director
 For and on behalf of: Beech Developments

Please return this completed terms and conditions agreement to:

The Coal Authority, Licensing & Permits Office, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG or e-mail it to permissions@coal.gov.uk

THE COAL AUTHORITY
200 LICHFIELD LANE
MANSFIELD
NOTTINGHAMSHIRE
NG18 4RG

Our reference: **71000300978001**
Your reference: **7476**
Date of your enquiry: **13 December 2012**
Date we received your enquiry: **13 December 2012**
Date of issue: **13 December 2012**

This report is for the property described in the address below and the attached plan.

Non-Residential Coal Authority Mining Report

YSGOL Y WERN, RHOS, WREXHAM,

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.

Coal mining	See comments below
Brine Compensation District	No

Information from the Coal Authority

Underground coal mining

Past

The property is in the likely zone of influence from workings in 3 seams of coal at shallow to 120m depth, and last worked in 1862.

Present

The property is not in the likely zone of influence of any present underground coal workings.

Future

The property is not in an area for which the Coal Authority is determining whether to grant a licence to remove coal using underground methods.

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

The property is not in an area that is likely to be affected at the surface from any planned future workings.

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

No notice of the risk of the land being affected by subsidence has been given under section 46 of the Coal Mining Subsidence Act 1991.

Mine entries

Within, or within 20 metres of, the boundary of the property there are 5 mine entries, the approximate positions of which are shown on the attached plan.

Our records disclose the following information:

329346-280. No treatment details.

329346-281. No treatment details.

329346-279. No treatment details.

329346-278. No treatment details.

329346-080. This entry was drilled and grouted by means of three boreholes within the shaft during April/May 1973. A total of 15 tons of PFA grout at a PFA/cement ratio of 9:1 was injected under pressure. Similarly the made ground in the vicinity of the shaft was stabilised by drilling 16 holes in a ring 7.5m diameter into which 10 Tons of grout were injected. In mid 1973 correspondence was ongoing between the NCB and the Denbigshire Council regarding the specification for capping of the shaft but it is unknown if this was carried out..

Records may be incomplete. Consequently, there may exist in the local area mine entries of which the Coal Authority has no knowledge.

For an additional fee, the Coal Authority will provide a supplementary Mine Entry Interpretive Report. The report will provide a separate assessment for the mine entry (entries) referred to in this report. It will give details based on information in the Coal Authority's possession, together with an opinion on the likelihood of mining subsidence damage arising from ground movement as a consequence of the existence of the mine entry/entries. It will also give details of the remedies available for subsidence damage where the mine entry was sunk in connection with coal mining. Please note that it may not be possible to produce a report if the main building to the property cannot be identified from Coal Authority plans (ie. for development sites and new build).

For further advice on how to order this additional information visit www.groundstability.com or telephone 0845 7626 848.

Coal mining geology

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

Opencast coal mining

Past

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

Present

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

Future

The property is not within 800 metres of the boundary of an opencast site for which the Coal Authority is determining whether to grant a licence to remove coal by opencast methods.

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.

Coal mining subsidence

There are 1 claim(s) within 50 metres of the property boundary that do not match the property address. These are shown on the attached plan.

The 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.

If further subsidence damage claims information is required in addition to that provided in this report, the Authority need to manually search their records. For further advice on how to order this additional information visit www.groundstability.com or telephone 0845 7626 848.

Mine gas

There is no record of a mine gas emission requiring action by the Coal Authority within the boundary of the property.

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.

Withdrawal of support

The property is not in an area for which a notice of entitlement to withdraw support has been published.

The property is not in an area for which a notice has been given under section 41 of the Coal Industry Act 1994, revoking the entitlement to withdraw support.

Working facilities orders

The property is not in an area for which 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.

Payments to owners of former copyhold land

The property is not in an area for which a relevant notice has been published under the Coal Industry Act 1975/Coal Industry Act 1994.

Comments on Coal Authority information

The attached plan shows the approximate location of the disused mine entry/entries referred to in this report. For reasons of clarity, mine entry symbols may not be drawn to the same scale as the plan.

Property owners have the benefit of statutory protection (under the Coal Mining Subsidence act 1991*). This contains provision for the making good, to the reasonable satisfaction of the owner, of physical damage from disused coal mine workings including disused coal mine entries. A leaflet setting out the rights and the obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0845 762 6848 or online at www.coal.decc.gov.uk/en/coal/cms/services/claims.

If you wish to discuss the relevance of any of the information contained in this report you should seek the advice of a qualified mining engineer or surveyor. If you or your adviser wish to examine the source plans from which the information has been taken these are normally available at our Mansfield office, free of charge, by prior appointment, telephone 01623 637235. Should you or your adviser wish to carry out any physical investigations that may enter, disturb or interfere with any disused mine entry the prior permission of the owner must be sought. For coal mine entries the owner will normally be the Coal Authority.

The Coal Authority, regardless of responsibility and in conjunction with other public bodies, provide an emergency call out facility in coalfield areas to assess the public safety implications of mining features (including disused mine entries). Our emergency telephone number at all times is 01623 646333.

*Note, this Act does not apply where coal was worked or gotten by virtue of the grant of a gale in the Forest of Dean, or any other part of the Hundred of St. Briavels in the county of Gloucester.

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.

Information from the Cheshire Brine Subsidence Compensation Board

The property lies outside the Cheshire Brine Compensation District.

Additional Remarks

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 2006. The Coal Authority owns the copyright in this report. The information we have used to write this report is protected by our database right. All rights are reserved and unauthorised use is prohibited. If we provide a report for you, this does not mean that copyright and any other rights will pass to you. However, you can use the report for your own purposes.

Location map



Approximate position
of property



Enquiry boundary

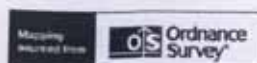
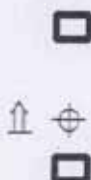
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Key

Approximate position of enquiry
boundary shown

Disused Adit or Mineshaft

Coal Claims





CLOSURE SUMMARY FORM – PERMIT 7476

PERMISSION TO ENTER OR DISTURB COAL AUTHORITY MINING INTERESTS

Permit Holder: Beech Developments 24 Middle Road Coedpoeth WREXHAM LL11 3TN	Site Location: Ysgol Y Wern Rhos Wrexham
---	--

Within 90 days of site operations finishing, this form must be completed and returned to the Coal Authority **together with a completion/validation report** detailing the work which was carried out to our property.

The attached completion report should include: *number of boreholes; grout takes, treatments and stabilisation works carried out in relation to mine workings or mine entries (including engineering drawings); a scaled site layout plan (correlated to O.S National Grid) showing the relevant mine entry positions, voids and broken ground proved by the works, et al.*

On what date did operations commence?	
On what date did operations finish?	

Risk Factor	Factors	Comments					
Mine Gas Monitoring	What gases were found during the works? (Include maximum readings / flow rates/ barometric pressure)	Carbon Monoxide (CO)	Methane (CH4)	Carbon Dioxide (CO2)	Oxygen (O2)	Other gases (Please specify)	None
	Where were the gases found?	Drill Rig	On-site Buildings	Off-site buildings	Monitoring Points	Other locations (please specify)	

Risk Factor	Factors	Yes	No	Comments
Spontaneous Combustion	Was spontaneous combustion found or created during the works?			If yes, provide the circumstance details together with any relevant treatment information.
Mine Water	Was mine water encountered during the works?			
Collapse of shallow mine workings or mine entries	Did any mine workings or mine entries collapse during the work activities?			

Signed.....	Date
Print Name	Position
E-mail	Tel No

In order for this file to be closed please send this closure form together with the completion report to:
The Coal Authority, Licensing & Permits Office, 200 Lichfield Lane, Mansfield, Nottinghamshire, NG18 4RG
 or e-mail it to permissions@coal.gov.uk

COAST
PROPERTY

STATE OF CALIFORNIA

COUNTY OF SAN DIEGO

Know all men by these presents, that I, the undersigned, do hereby certify that the within and foregoing is a true and correct copy of the original as the same appears from the records of the County of San Diego, State of California.

Y

Witness my hand and seal of office this 1st day of January, 1901.

County Clerk of San Diego

Notary Public in and for the State of California

My commission expires this 1st day of January, 1901.

Subscribed and sworn to before me this 1st day of January, 1901.

Notary Public in and for the State of California

My commission expires this 1st day of January, 1901.

Subscribed and sworn to before me this 1st day of January, 1901.

Notary Public in and for the State of California

My commission expires this 1st day of January, 1901.

Subscribed and sworn to before me this 1st day of January, 1901.

APPENDIX C

GroundSure Report

Client: The Coal Authority



Report Reference: 00071671-11

The Coal Authority Property Search Services
200 Lichfield Lane, Berry Hill,
Mansfield, Nottinghamshire, NG18 4RG
Phone: 0845 762 6848
DX 716176 MANSFIELD 5

GroundSure Reference: 00071671-11
Our Reference: 00071671-11
Your Reference: PR/H485/1
RRUID: 005.00016881560001
Report Date: Nov 24, 2011

Commercial Enviro All-in-One

**Address: YSGOL Y WERN, PENTREDWR, RHOSLLANERCHRUGOG,
WREXHAM, LL14 1DD**

Thank you for placing your order with the Coal Authority Property Search Services.

Please find enclosed the GroundSure Screening and Coal Authority CON29M Coal Mining and Brine Subsidence Claim report.

This table summarises whether the Coal Authority consider that the following conditions may affect the ground stability at the location above. A fuller explanation of the condition and its potential to result in ground movement are given in Appendix 1 at the back of the report.

Coal Mining	yes
Brine Compensation Area	no

If you need any further assistance, please do not hesitate to contact our helpline on 0845 762 6848 quoting the above report reference number.

Enc,
GroundSure Screening and the Coal Authority CON29M Coal Mining And Brine Subsidence Claim Report

Aerial Photograph of Study Site



Aerial photography supplied by Getmapping PLC.
© Copyright Getmapping PLC 2003. All Rights Reserved.

Site Name: YSGOL Y WERN, PENTREDWR, RHOSLLANERCHRUGOG,
WREXHAM, LL14 1DD

Grid Reference: 329290,346191

Size of Site: 0.56 ha

Report Reference: 00071671-11

Executive Summary

The following opinion is provided by GroundSure on the basis of the information available at the time of writing and contained within this report.

Acceptable Environmental Risk

Is there a risk of statutory (e.g. Part IIA EPA 1990) or third party action being taken against the site?	Unlikely
Does the property represent Acceptable Banking Security from an environmental risk perspective?	Yes
Is there a risk that the property value may be impacted due to environmental liability issues?	Unlikely
What is the potential for environmental risk associated with property ownership i.e. that a prudent purchaser may wish to consider further?	Low-Moderate

The Coal Authority Assessment

This table summarises whether the Coal Authority consider that the following conditions may affect the ground stability at the location above. A fuller explanation of the condition and its potential to result in ground movement are given in Appendix 1 at the back of this report.

Coal Mining	yes
Brine Compensation Area	no

This assessment 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.

Recommendations

None Required.

If you would like any further assistance regarding this report, then please contact the GroundSure Helpline on 08444 159000.

Environmental Consultancy: GroundSure Environmental Consultants are available to discuss the findings of this report free of charge and to assist in possible solutions where reports are determined to be In Need of Further Assessment, or where other outstanding environmental issues require further consideration.

Environmental Insurance: Environmental insurance may be available for the subject property. Please contact GroundSure for further details.

Consultant's Opinion

Issue	Guidance
Current land use	GroundSure has not been advised by the client (or their advisers) of the current use of the property. GroundSure has therefore made a best judgement based on the available information that the property is likely to be used as a school.
Proposed land use	GroundSure has not been advised by the client (or their advisers) of the proposed use of the property. GroundSure has therefore made a best judgement based on the available information that the property is likely to continue in its current use.
On site potentially contaminative issues	No potentially contaminative land uses have been identified at the study site.
Off site potentially contaminative issues	Potentially contaminative historic and current industrial land uses of minor concern have been identified in proximity to the study site.
Potentially vulnerable receptors	Potentially vulnerable receptors have been identified including the underlying secondary A aquifer located within the bedrock formation and residential gardens adjacent to the north and east, 2m south, and 17m east. Additionally, a potable groundwater abstraction licence has been identified 1502m north.
Conclusion	GroundSure has not identified a potential source-pathway-receptor relationship that may give rise to significant environmental liability. Please refer to the GroundSure Risk Assessment Methodology contained within this report.

Additional Matters

The following additional risk issues are outside the scope of the opinion provided by this report. However, further consideration of these may be appropriate for the subject property.

Issue	Guidance
Site specific features	This report has considered additional site specific information, where provided, however it has not included a site inspection. Additional issues may be present at the property that cannot be reasonably identified by a report of this nature. Such issues may include but not be limited to: ozone depleting substances, oil storage, waste management, materials handling, site drainage, etc. Should these issues be considered to be of concern further specific assessments may be required via additional surveys, inspections, etc.
Asbestos	The Control of Asbestos Regulations 2006 require an Asbestos Management Plan to be maintained for all commercial property constructed prior to 2000 i.e. where asbestos may be contained within the building fabric. Refurbishment or demolition of site structures may require further Type 3 Asbestos Surveys.
Infilled Land	No issues identified.
Flooding	The property does not lie within 25m of an Environment Agency floodplain.
Natural Ground Subsidence	No issues identified.
Shallow Mining	The BGS has identified a moderate potential for the property to be affected by shallow mining. Further information may be available from a RICS accredited surveyor, local Building Control or direct from the BGS. Contact details are provided in Section 12 of this report.
Radon	5-10% of properties in the area have the potential to be radon affected. A prudent purchaser may wish to contact the Health Protection Agency for further advice. Contact details are given in Section 12 of this report.
Radon Protection	Basic radon protective measures are likely to be required at the property. A prudent purchaser may wish to contact the Building Control department at the Local Authority or the Health Protection Agency for further guidance. Contact details are given in Section 12 of this report.

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary					
	on-site	0-50	51-250	251-500	501-1000	1000-1500
1. Historical Industrial Sites						
1.1 Potentially Contaminative Past Land Use						
Records of potentially contaminative past land use (1:10,000 scale mapping)	0	0	39	-	-	-
1.2 Additional Information – Historical Tanks (1:2,500,1:1,250 scale mapping)	0	0	0*	-	-	-
1.3 Additional Information – Historical Energy Features (1:2,500,1:1,250 scale mapping)	0	0	18*	-	-	-
1.4 Additional Information – Historical Petrol and Fuel Site Database (1:2,500,1:1,250 scale mapping)	0	0	0*	-	-	-
1.5 Additional Information – Historical Vehicle Repair and Garages (1:2,500,1:1,250 scale mapping)	0	11	0*	-	-	-
1.6 Potentially Infilled Land						
Records of potentially infilled land (1:10,000)	0	0	13*	-	-	-
*51-100m						
2. Environmental Permits, Incidents and Registers						
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
Records of Historic IPC Authorisations	0	0	0	0	-	-
Records of Part A(1) and IPPC Authorised Activities	0	0	0	0	-	-
Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0	-	-
Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0	-	-
Records of List 1 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0	-	-
Records of Licensed Discharge Consents	0	0	0	4	-	-
Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0	-	-
2.2 Records of COMAH and NIHS sites	0	0	0	0	-	-
2.3 Environment Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	0	0	0	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
2.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-

3. Landfill and Other Waste Sites	on-site	0-50	51-250	251-500	501-1000	1000-1500
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3.1 Landfill Sites

Environment Agency Registered landfill Sites	0	0	0	0	0	-
Landfill Data – Operational Landfill Sites	0	0	0	0	0	-
Environment Agency Historic Landfill Sites	0	0	0	1	1	7
Landfill Data – Non-Operational Landfill Sites	0	0	0	0	1	-
BGS/DoE Landfill Site Survey	0	0	0	0	0	0
GroundSure Local Authority Landfill Sites Data	0	0	0	0	1	6

3.2 Landfill and Other Waste Sites Findings

Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	0	-	-
Environment Agency licensed Waste Sites	0	0	0	0	3	5

4. Current Land Uses	on-site	0-50	51-250	251-500	501-1000	1000-1500
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4.1 Current Industrial Sites Data	0	1	10	-	-	-
4.2 Records of Petrol and Fuel Sites	0	0	0	1	-	-
4.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0	-	-

5. Geology	Description
------------	-------------

- 5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? *
- 5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site? *
- 5.3 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.
- Source: Scale: 1:50,000 BGS Sheet 121

No

Yes

* This includes an automatically generated 50m buffer zone around the site.

6. Hydrogeology and Hydrology	on-site	0-50	51-250	251-500	501-1000	1001-2000
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6.1 Are there any records of Productive Strata in the Superficial Geology within 500m of the study site?	Yes																		
6.2 Are there any records of Productive Strata in the Bedrock Geology within 500m of the study site?	Yes																		
6.3 Groundwater Abstraction Licences (within 1000m of the study site).	0	0	0	0	0	-													
6.4 Surface Water Abstraction Licences (within 1000m of the study site).	0	0	0	0	0	-													
6.5 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	2													
6.6 Are there any Source Protection Zones within 500m of the study site?	No																		
6.7 River Quality	<table><tr><th>on-site</th><th>0-50</th><th>51-250</th><th>251-500</th><th>501-1000</th><th>1001-1500</th></tr><tr><td>Is there any Environment Agency information on river quality within 1500m of the study site?</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td>Yes</td></tr></table>						on-site	0-50	51-250	251-500	501-1000	1001-1500	Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	Yes
on-site	0-50	51-250	251-500	501-1000	1001-1500														
Is there any Environment Agency information on river quality within 1500m of the study site?	No	No	No	No	No	Yes													
6.8 Detailed River Network entries within 500m of the site	0	0	0	4	-	-													
6.9 Surface water features within 250m of the study site	No	No	No	-	-	-													

7. Flooding

7.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site?	No
7.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site?	No
7.3 Are there any Flood Defences within 250m of the study site?	No
7.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.5 Are there any areas used for Flood Storage within 250m of the study site?	No
7.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Very Low
7.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Low

8. Designated Environmentally Sensitive Sites

	on-site	0-50	51-250	251-500	501-1000	1001-1500
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	1	-	-
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	-	-
8.3 Records of Local Nature Reserves (LNR)	0	0	0	0	-	-
8.4 Records of Special Areas of Conservation (SAC)	0	0	0	1	-	-
8.5 Records of Special Protection Areas (SPA)	0	0	0	0	-	-
8.6 Records of Ramsar sites	0	0	0	0	-	-
8.7 Records of World Heritage Sites	0	0	0	0	-	-
8.8 Records of Environmentally Sensitive Areas	0	0	0	0	-	-
8.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	-	-
8.10 Records of National Parks	0	0	0	0	-	-
8.11 Records of Nitrate Sensitive Areas	0	0	0	0	-	-

9. Additional Information

	on-site	0-50	51-250
9.1 Records of mobile phone transmitters	0	0	0
9.2 Records of potential sites of OfCom telecommunications masts	0	0	0
9.3 Have any overhead transmission lines been identified in proximity to the study site in this search?			No

10. Natural Hazards

10.1 What is the maximum risk of natural ground subsidence?	Very Low
10.2 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 5 and 10% of properties are above the Action Level
Is the property in an area where radon protection measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	Basic radon protective measures are necessary

11. Non CON29M Coal Mining Information

11.1 Are there any coal mining areas within 75m of the study site?	Yes
11.2 What is the risk of subsidence relating to shallow mining within 150m of the study site?	Moderate
11.3 Are there any brine affected areas within 75m of the study site?	No
The Coal Authority CON29M Coal and Brine report	Appendix 1

Using this Report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 250m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure underground oil and gas pipelines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on groundwater vulnerability, soil leaching potential, abstraction licenses, Source Protection Zones (SPZ) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and tidal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas and World Heritage Sites. These searches are conducted using radii of up to 500m.

9. Additional Information

Provides information on records of mobile phone transmitters, potential sites of OfCom telecommunication masts and overhead transmission lines up to 500m.

10. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon.

11. Non Con29m Mining Information

Provides information on areas of coal and shallow mining.

12. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, GroundSure provide a free Technical Helpline (08444 159000) for further information and guidance.

Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

GroundSure Risk Assessment Methodology

Framework

This report is designed to provide a basic environmental liability risk assessment for the purposes of transaction due diligence, financing arrangements and similar circumstances. The report comprises a basic risk assessment within the general principles of the source-pathway-receptor pollutant linkage model and with due regard for relevant publications issued by the Department of Environment, Food and Rural Affairs (and predecessor government departments) the British Standards Institute and the European Union.

Explicit opinion is provided with regard to potential liability for the property to be identified as "Contaminated Land" in accordance with the meaning set out in Part IIA of the Environmental Protection Act 1990. Consideration and due regard is also made of associated legislation that may lead to related statutory or third party environmental liability, including but not limited to the Water Resources Act 1991, the Water Act 2003, the Contaminated Land Regulations 2006, Environmental Permitting Regulations 2007.

This report does not contain a detailed Conceptual Site Model as required in Planning Policy Statement 23, however, it may prove highly effective in determining whether such further assessment is appropriate.

The report is based upon the information contained in subsequent dataset sections. Some datasets have been generated by and are unique to GroundSure, whilst others are provided by recognised bodies including the Environment Agency, British Geological Survey, Health Protection Agency, Local Authorities, etc. GroundSure may also have been provided with further details regarding the site by the client and / or his advisers. In the absence of such, GroundSure has made a best estimation regarding current and proposed land use. This report and the risk assessment presented is based purely upon this information.

In undertaking this report GroundSure has not, unless explicitly stated to the contrary, undertaken a site inspection, site investigation, consulted directly with the local authority with specific regard to the subject property or reviewed existing environmental reports. Whilst every effort is made to consider likely environmental liabilities on the basis of the information assessed, certain issues may only be readily discernible from physical site inspection and / or investigation.

Source - Pathway - Receptor Definitions

Sources of contamination include:

- Historic on-site and historic off-site sources
- Current on-site and current off-site sources

Pathways comprise:

- Mechanisms facilitating "receptor" exposure to contaminative "sources"

Receptors include:

- Human health i.e. site users, adjacent site users
- Controlled Waters i.e. groundwater, surface water
- Habitats and biodiversity
- Property, buildings and infrastructure

Risk Assessment Definitions

Acceptable Environmental Risk: Significant potential environmental liabilities have not been identified

In Need of Further Assessment: Significant potential environmental liabilities have been identified

Is there a risk of statutory (e.g. Part IIA EPA 1990) or third party action being taken against the site?

This response considers the risk of legal liability arising through ownership or occupation and use of the property through statutory or other third party claims.

Does the property represent Acceptable Banking Security from an environmental risk perspective?

Consideration is given to the suitability of the property as robust financial security for the purposes of secured lending facilities. An assumption is made here that the subject property is being considered in isolation and that normal commercial lending loan to value ratios are being considered.

GroundSure may in certain circumstances be able to make a specific lender liability assessment based on a full view of financial arrangements and hence the commercial context of the environmental risks.

Is there a risk that the property value may be impacted due to environmental liability issues?

This response sets out to advise whether environmental liabilities are likely to materially impact upon a standard Royal Institution of Chartered Surveyors valuation of the property necessitating further assessment.

What is the potential for environmental risk associated with property ownership i.e. that a prudent purchaser may wish to consider further?

Low: There are unlikely to be significant environmental liabilities associated with the property

Low-Moderate: There are unlikely to be significant environmental liabilities associated with the property with regard to the proposed use. However, minor issues may require further consideration and further assessment may be appropriate under certain circumstances e.g. redevelopment

Moderate: Some potential environmental liabilities are likely to reside with the property as a result of historical and / or current use. Whilst unlikely to represent an immediate significant issue, if left unchecked this position may change with time. A prudent purchaser may wish to make further enquiries of the vendor / undertake limited further due diligence / seek environmental improvements. Redevelopment of the site will likely require further, more detailed assessment.

Moderate-High: Some potential significant environmental liability issues have been identified at the property requiring further assessment. Should further information be available it may be possible to re-assess the risk. In the absence of sufficient further information, further assessment might comprise consultation with the environmental regulators / review of existing environmental reports / commissioning new environmental reports / consideration of environmental insurance.

High: Significant potential environmental liabilities have been identified at the property. Further detailed environmental due diligence will likely be required and may include review of existing environmental reports / commissioning new environmental reports including site investigations / consideration of environmental insurance / transaction restructuring.

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from High Detail (1:10,000 scale) Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 250m of the search centre: 39

The following records are not represented on Mapping:

Distance [m]	Direction	Use	Date
53.0	S	Unspecified Heap	1949
53.0	S	Unspecified Heap	1898
59.0	S	Unspecified Heap	1960
59.0	S	Unspecified Heap	1909
68.0	SE	Unspecified Heap	1949
69.0	SE	Unspecified Heap	1909
71.0	SE	Unspecified Heap	1960
78.0	SE	Unspecified Heap	1873
89.0	S	Unspecified Heap	1873
90.0	SE	Unspecified Heap	1898
101.0	SE	Unspecified Heap	1873
101.0	N	Unspecified Heap	1873
121.0	E	Unspecified Heap	1873
133.0	SW	Unspecified Heap	1960
135.0	SW	Unspecified Heap	1909
136.0	SW	Unspecified Heap	1873
136.0	SW	Unspecified Heap	1949
154.0	SE	Unspecified Heap	1898
164.0	SE	Unspecified Heap	1873
169.0	SW	Unspecified Ground Workings	1873
173.0	SE	Unspecified Disused Shaft	1974
175.0	SE	Unspecified Old Shaft	1898
188.0	S	Unspecified Heaps	1898
191.0	E	Unspecified Heap	1873
199.0	NE	Unspecified Heap	1898
204.0	S	Unspecified Ground Workings	1873
207.0	S	Unspecified Old Shaft	1898
210.0	S	Unspecified Heap	1898
212.0	E	Unspecified Heap	1898
212.0	E	Unspecified Heap	1873
213.0	N	Unspecified Heap	1873
220.0	E	Unspecified Heap	1873
223.0	S	Unspecified Heap	1873
225.0	S	Unspecified Heap	1898
231.0	NW	Railway Sidings	1898
234.0	S	Unspecified Heap	1873
241.0	NW	Disused Railway Sidings	1960
246.0	NW	Tramway Sidings	1949
247.0	NW	Railway Building	1960

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 100m of the search centre: 0

Database searched and no data found.

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 100m of the search centre:

18

The following records are not represented on Mapping:

Distance (m)	Direction	Use	Date
60.0	N	Electricity Sub Station	1994
60.0	N	Electricity Sub Station	1999
60.0	N	Electricity Sub Station	1996
60.0	N	Electricity Sub Station	1993
73.0	NE	Electricity Sub Station	1973
75.0	NE	Electricity Sub Station	1981
75.0	NE	Electricity Sub Station	1988
75.0	NE	Electricity Sub Station	1989
75.0	NE	Electricity Sub Station	1989
75.0	NE	Electricity Sub Station	1990
77.0	W	Electricity Sub Station	1990
78.0	W	Electricity Sub Station	1994
78.0	W	Electricity Sub Station	1996
78.0	W	Electricity Sub Station	1999
78.0	W	Electricity Sub Station	1993
78.0	W	Electricity Sub Station	1973
79.0	W	Electricity Sub Station	1981
79.0	W	Electricity Sub Station	1988

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 100m of the search centre:

0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 100m of the search centre:

11

The following records are not represented on Mapping:

Distance (m)	Direction	Use	Date
17.0	N	Garage	1990
17.0	N	Garage	1962
17.0	N	Garage	1973
19.0	N	Garage	1989
19.0	N	Garage	1981
19.0	N	Garage	1988
19.0	N	Garage	1989
19.0	N	Garage	1994
20.0	N	Garage	1999
20.0	N	Garage	1999
20.0	N	Garage	1996

Report Reference: 00071671-11

1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 100m of the study site: 13

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by GroundSure:

Distance [m]	Direction	Use	Date
53.0	S	Unspecified Heap	1898
53.0	S	Unspecified Heap	1949
59.0	S	Unspecified Heap	1960
68.0	SE	Unspecified Heap	1949
71.0	SE	Unspecified Heap	1960
78.0	SE	Unspecified Heap	1873
81.0	S	Cemetery	1898
88.0	S	Cemetery	1974
89.0	S	Unspecified Heap	1873
89.0	S	Cemetery	1960
90.0	SE	Unspecified Heap	1898
91.0	S	Cemetery	1949
98.0	S	Grave Yard	1873

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

Records of historic IPC Authorisations within 500m of the study site: 0

Database searched and no data found.

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: 0

Database searched and no data found.

Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 0

Database searched and no data found.

Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 0

Database searched and no data found.

Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: 0

Database searched and no data found.

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: 0

Database searched and no data found.

Records of Licensed Discharge Consents within 500m of the study site: 4

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance [m]	Direction	NGR	Details	
1	346.0	W	328906, 346056	Address: Bersham Colliery Cso, Wrexham Road, Rhosyllen, Wrexham, Wales, LL14 4DW Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: CM0176001 Permit Version: 2	Receiving Water: Pant Brook Avon Soch Status: Varied By Application - (wra 91 Sched 10 - As Amended By Env Act 1995) Issue date: 19/3/2004 Effective Date: 31/3/2004 Revocation Date: -
2	374.0	SW	328900, 346000	Address: Rhoslanerchrugog Bryn Y Brai, Rhoslanerchrugog Bryn Y Brai Effluent Type: Unspecified Permit Number: CM0176001 Permit Version: 1	Receiving Water: Pant Brook Avon Soch Status: New Consent, By Application (wra 91, Section 88) Issue date: - Effective Date: - Revocation Date: 30/3/2004
3	419.0	SW	329010, 345820	Address: Rhos Osborne Street, Rhos Osborne Street, Osborne Street Effluent Type: Unspecified Permit Number: CM0057901 Permit Version: 1	Receiving Water: Trib.of Goch Status: Consent Expired - Time Limit Issue date: 27/6/1969 Effective Date: 27/6/1969 Revocation Date: 5/4/1995
4	421.0	E	329770, 346130	Address: Ffordd Offa Rhoslanerchrugog, Ffordd Offa Rhoslanerchrugog, Rhoslanerchrugog, Rhoslanerchrugog, Rhoslanerchrugog Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: CG0359501 Permit Version: 1	Receiving Water: Unnamed Watercourse Status: New Consent, By Application (wra 91, Section 88) Issue date: 21/7/1994 Effective Date: 21/7/1994 Revocation Date: -

Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: 0

Database searched and no data found.

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

2.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: 0

Database searched and no data found.

Records of National Incidents Recording System, List 1 within 250m of the study site: 0

Database searched and no data found.

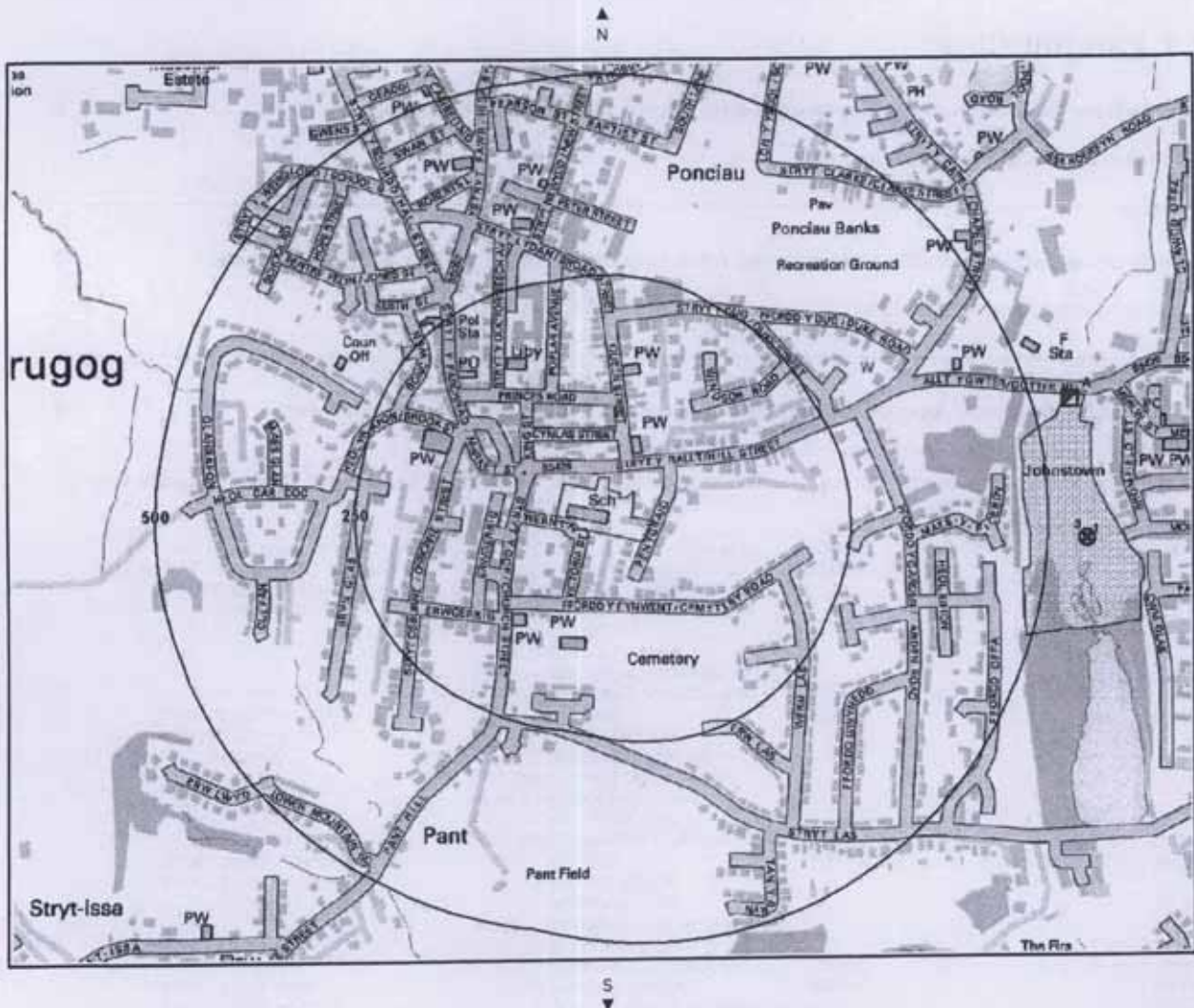
2.4 Sites Determined as Contaminated Land under Part IIA EPA 1990¹

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Report Reference: 00071671-11

Database searched and no data found.

3. Landfill and Other Waste Sites Map



Landfill & Other Waste Sites Legend

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- | | | |
|--------------------|---------------------------------------|-------------------------------------|
| Site Outline | E.A. Active Landfill | Operational Waste Treatment Licence |
| Search Buffers (m) | E.A. Historic Landfill (Area Data) | Closed Waste Treatment Licence |
| | E.A. Historic Landfill (Point Data) | REGIS Waste Licence |
| | BGS / DoE Survey Landfill | Operational Landfill |
| | Local Authority Landfill (Area Data) | Closed Landfill |
| | Local Authority Landfill (Point Data) | |

3. Landfill and Other Waste Sites

3.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site:

0

Database searched and no data found.

Records of operational landfill sites sourced from Landmark within 1000m of the study site:

0

Database searched and no data found.

Records of Environment Agency historic landfill sites within 1500m of the study site:

9

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	NGR	Details
3	469.0	E	329800, 346100	Site Address: Stryd Las, Stryd Las, Johnstown, Wrexham Waste Licence: Yes Site Reference: NOW-513-L, WMBC L75 Waste Type: Inert Regis Reference: WW1/L/WAT001 Licence Issue: 22-Jul-1993 Licence Surrendered: 17-Aug-2005 Licence Hold Address: - Operator: -
Not shown	781.0	N	329000, 347000	Site Address: Cae Dwr Old Tip, Cae Dwr Waste Licence: - Site Reference: - Waste Type: Inert, Industrial, Commercial, Household, Special Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -
Not shown	1014.0	N	328800, 347200	Site Address: Railway Cutting Fill, Cae Dwr Waste Licence: - Site Reference: - Waste Type: Industrial, Special Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -
Not shown	1148.0	N	328800, 347300	Site Address: Llwyneinion Acid Tar Lagoon, Llwyneinion Waste Licence: - Site Reference: - Waste Type: Industrial, Special, Liquid sludge Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -
Not shown	1221.0	NW	328700, 347300	Site Address: Llwyneinion Brick Works Small Quarry, Llwyneinion Waste Licence: - Site Reference: - Waste Type: Inert, Industrial, Commercial, Household Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -
Not shown	1272.0	N	328900, 347500	Site Address: Llwyneinion Old Refuse Tip No.1, Llwyneinion Waste Licence: - Site Reference: - Waste Type: Inert, Industrial, Commercial, Household, Special Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -
Not shown	1289.0	N	328800, 347500	Site Address: Cae Dwr Brickworks, Cae Dwr Waste Licence: Yes Site Reference: - Waste Type: Industrial, Commercial, Household Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

Not shown	1330.0	E	330800, 345500	Site Address: Hafod Quarry, Bangor Road, Johnstown, Wrexham Waste Licence: Yes Site Reference: - Waste Type: - Regis Reference: WW1/L/SWM001	Licence Issue: 30-Apr-1999 Licence Surrendered: 23-May-2005 Licence Hold Address: - Operator: -
Not shown	1370.0	N	328700, 347600	Site Address: Monsanto Chemical Tip, Cae Dwr Waste Licence: - Site Reference: - Waste Type: Special Regis Reference: -	Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

Records of non-operational landfill sites sourced from Landmark within 1000m of the study site: 1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	NGR	Details	Record Date: 01-Jul-1993
1	550.0	E	329900, 346150	Site Address: Stryd Las Landfill, Between Stryd Las & Gutter Hill, Johnstown, WREXHAM, Clwyd, Landfill Licence: W1FAMPAL Agency Reference: EAWML37077 Waste Type: Non-Hazardous Waste Description: Non-Hazardous Landfill Known Restrictions: Waste produced/controlled by licence holder	Transfer Date: Modification Date: Status: Site closed Category: LANDFILL Regulator: EA - Welsh Region - Northern Area (Buckley) Size: Medium (< 75,000 tonnes/year)

Records of BGS/DoE non-operational landfill sites within 1500m of the study site: 0

Database searched and no data found.

Records of Local Authority landfill sites within 1500m of the study site: 7

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	Site Address	Source	Data Type
Not shown	994.0	S	Refuse Tip	1975 mapping	Polygon
Not shown	1148.0	N	Refuse Tip	1962 mapping	Polygon
Not shown	1148.0	N	Refuse Tip	1962 mapping	Polygon
Not shown	1220.0	NW	Refuse Tip	1962 mapping	Polygon
Not shown	1220.0	NW	Refuse Tip	1962 mapping	Polygon
Not shown	1277.0	N	Refuse Tip	1962 mapping	Polygon
Not shown	1277.0	N	Refuse Tip	1962 mapping	Polygon

3.2 Other Waste Sites

Records of operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Database searched and no data found.

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site: 0

Report Reference: 00071671-11

Database searched and no data found.

Records of Environment Agency licensed waste sites within 1500m of the study site:

8

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance [m]	Direction	NGR	Details
12A	548.0	E	329878, 346325	Site Address: Stryd Las, Johnstown, Wrexham, LL14 2AN Type: Landfill taking Non-Biodegradable Wastes Size: >= 75000 tonnes Regis Licence Number: WAT001 Operator: Watkin Jones & Sons Surrendered Date: - Waste Management licence No: 37077 Annual Tonnage: 0.0 Issue Date: 22/07/1993 Expiry Date: - Effective Date: - Status: Modified Modified: 31/03/2003 Site Name: Stryd Las Cancelled Date: - Correspondence Address: Unit 21, Llandegai Ind Est, Bangor, Gynedd, LL57 4YH
13A	548.0	E	329878, 346325	Site Address: Stryd Las, Johnstown, Wrexham, Clwyd, LL14 2AN Type: Landfill taking Non-Biodegradable Wastes Size: < 25000 tonnes Regis Licence Number: WAT001 Operator: Watkin Jones & Son Ltd Surrendered Date: 17/08/2005 Waste Management licence No: 37077 Annual Tonnage: 150000.0 Issue Date: 22/07/1993 Expiry Date: - Effective Date: - Status: Surrendered Modified: 31/03/2003 Site Name: Stryd Las Cancelled Date: - Correspondence Address: -
14A	548.0	E	329878, 346325	Site Address: Stryd Las, Johnstown, Wrexham, LL14 2AN Type: Landfill taking Non-Biodegradable Wastes Size: < 25000 tonnes Regis Licence Number: WAT001 Operator: Watkin Jones & Sons Surrendered Date: 17/08/2005 Waste Management licence No: 37077 Annual Tonnage: 0.0 Issue Date: 22/07/1993 Expiry Date: - Effective Date: - Status: Surrendered Modified: 31/03/2003 Site Name: Stryd Las Cancelled Date: - Correspondence Address: Unit 21, Llandegai Ind Est, Bangor, Gynedd, LL57 4YH
Not shown	1319.0	SE	330096, 345069	Site Address: H K Motors, Gardden Industrial Estate, Ruabon, Wrexham, Clwyd, LL14 6RG Type: Metal Recycling Site (Vehicle Dismantler) Size: < 25000 tonnes Regis Licence Number: HKM002 Operator: Williams H K; K; D H; A K; C A; I J And N G Williams Surrendered Date: - Waste Management licence No: 37231 Annual Tonnage: 4999.0 Issue Date: 28/03/2003 Expiry Date: - Effective Date: - Status: Modified Modified: 10/12/2003 Site Name: H K Motors, Ruabon Cancelled Date: - Correspondence Address: -
Not shown	1377.0	SE	330082, 344990	Site Address: Gardden Ind Est, Ruabon, Wrexham, LL14 6RG Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: HAY001 Operator: Haywards I Surrendered Date: - Waste Management licence No: 37162 Annual Tonnage: 0.0 Issue Date: 31/03/1999 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: I Haywards Ltd Cancelled Date: - Correspondence Address: Gardden Ind Est, Ruabon, Wrexham, LL14 6RG
Not shown	1377.0	SE	330082, 344990	Site Address: Land / Premises At, Gardden Ind Est, Ruabon, Wrexham, Clwyd, LL14 6RG Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: HAY001 Operator: I Hayward Limited Surrendered Date: - Waste Management licence No: 37162 Annual Tonnage: 136152.0 Issue Date: 31/03/1999 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: I Hayward Ltd Cancelled Date: - Correspondence Address: -

Not shown	1390.0	SE	330053, 344957	Site Address: Gardden Industrial Estate, Ruabon, Wrexham, Clwyd, LL14 6RG Type: Vehicle depollution facility Size: < 25000 tonnes Regis Licence Number: CLW002 Operator: Clwyd Breakers Ltd Surrendered Date: - Waste Management licence No: 102006 Annual Tonnage: 74999.0	Issue Date: 07/10/2010 Expiry Date: - Effective Date: - Status: Issued Modified: - Site Name: Clwyd Breakers Ltd Cancelled Date: - Correspondence Address: -
Not shown	1418.0	SE	330083, 344942	Site Address: Land / Premises At, Gardden Ind Est, Ruabon, Wrexham, Clwyd, LL14 6RG Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Regis Licence Number: BEN001 Operator: Bennett D Surrendered Date: - Waste Management licence No: 37163 Annual Tonnage: 30000.0	Issue Date: 31/03/1999 Expiry Date: - Effective Date: - Status: Expired Modified: - Site Name: Clwyd Car Breakers Cancelled Date: - Correspondence Address: -

4. Current Land Use Map

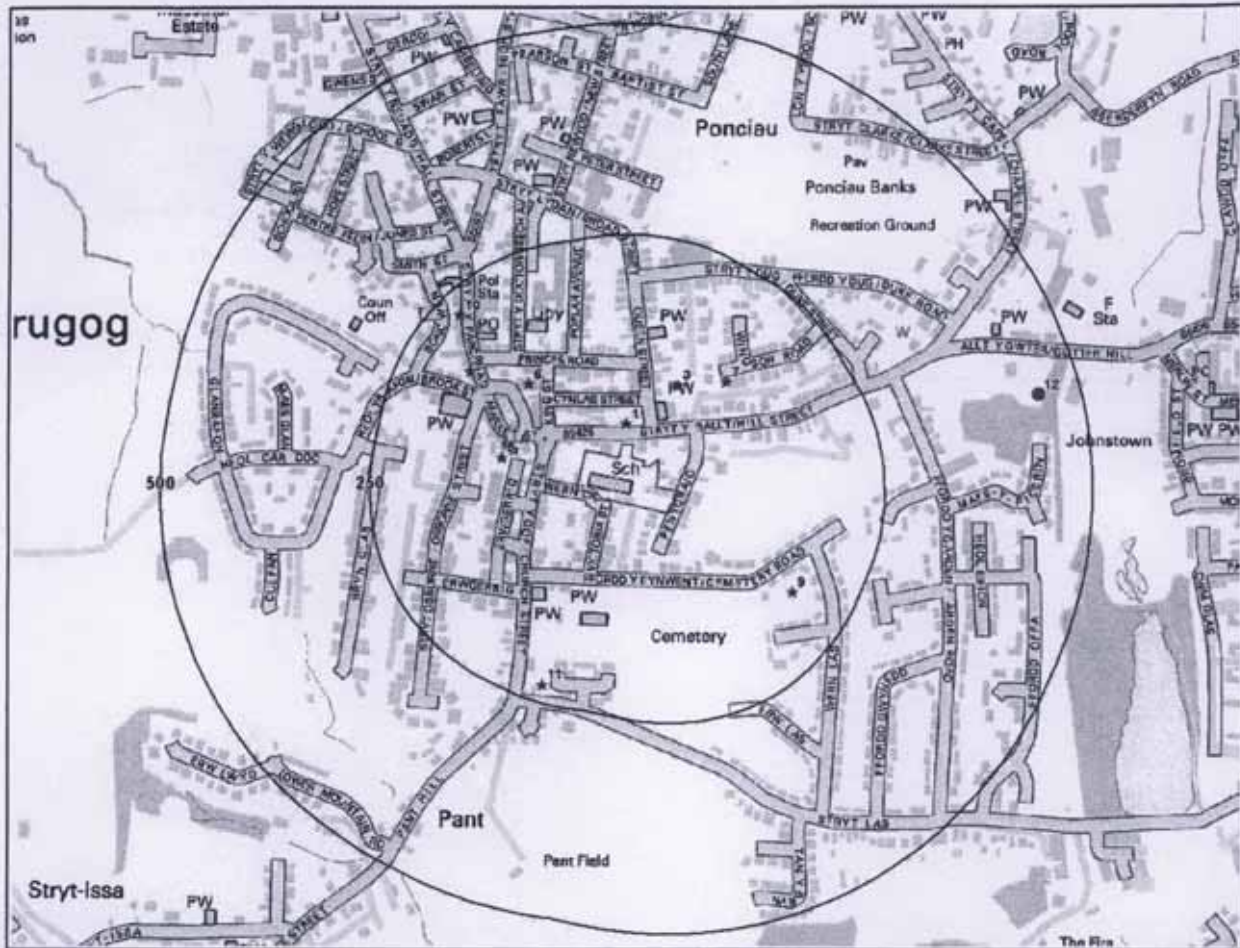
NW

N

NE

SW

SE



Current Land Use Legend

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- Site Outline
- Search Buffers (m)
- Current Industrial Sites
- Petrol & Fuel Sites
- Underground High Pressure Oil & Fuel Pipelines