



COAL MINING RISK ASSESSMENT

**11 HILL STREET
RHOS
WREXHAM
WALES
LL14 1LN**

Prepared for:

ARKIFY

By:

ENVIROSOLUTION LTD

Suite 53

3a Bridgewater St

Liverpool

L1 0AB

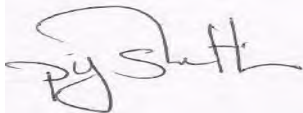
Date:

8th September 2022



EnviroSolution Ltd

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Checked by	Phil Shelton PhD BSc CEng MIMMM FGS	Signature	

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1 Introduction

1.1 Site Location and Description

The site for the proposed new residential dwelling is located at 11 Hill Street, Rhos, Wrexham in North Wales, LL14 1LN. The National Grid Reference for the development site is GR: 329270 346230. The plot is roughly square in shape and covers an area of approximately 390m². The ground elevation at the site is approximately 174m aOD.

The site is currently occupied by a residential dwelling and a partially demolished brick outbuilding. The site boundaries consist of brick walls and wooden panel fences.

The site is bounded by residential properties to the west, open ground to the south, Hill Street to the north, and Craig-y-Wern to the east.

A plan showing the location of the site is shown in **Figure 1**.

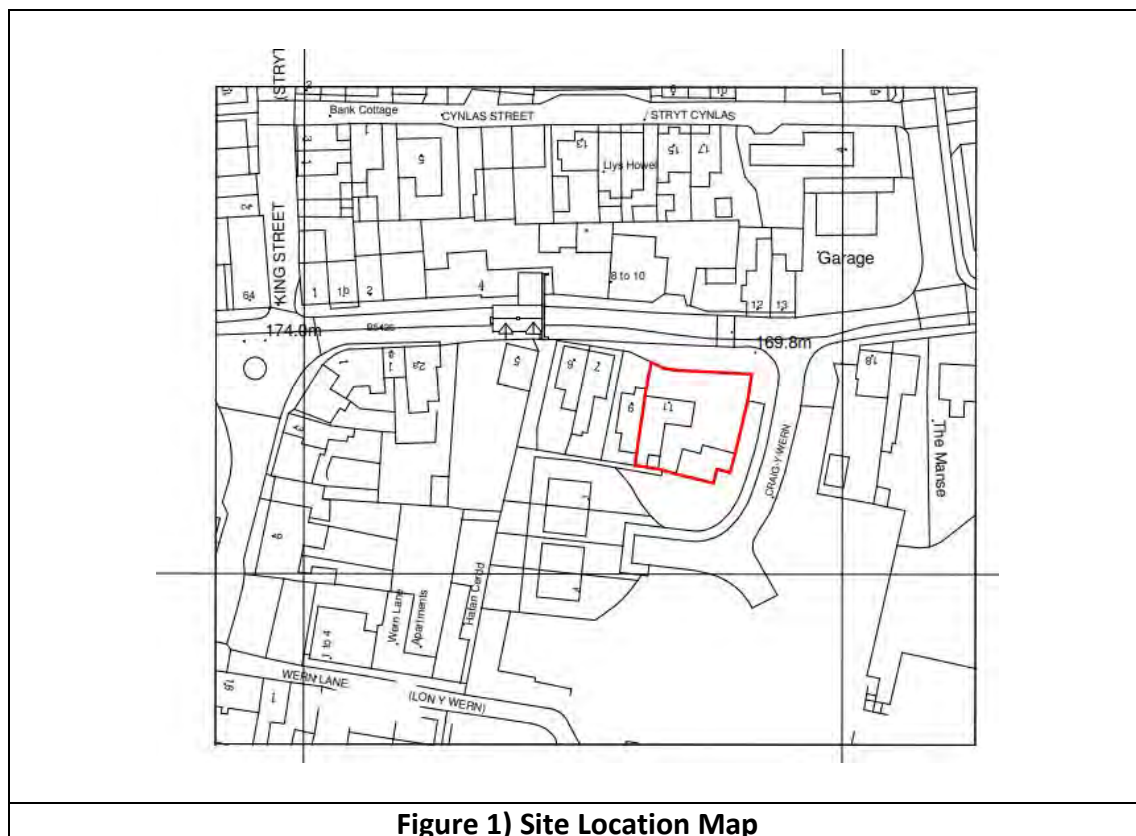


Figure 1) Site Location Map

1.2 Development Proposal

It is understood that the current proposal includes the demolition of the existing dwelling and the construction of 3 no. residential dwellings.

Details of the existing and proposed site layouts are shown in **Appendix A**.

1.3 Scope of Coal Mining Risk Assessment

EnviroSolution Ltd has been commissioned to prepare a Coal Mining Risk Assessment Report (CMRA) for the proposed development site, in order to provide the Local Planning Authority with information on the coal mining legacy risk(s), an assessment of their potential impact on land stability, and provide recommendations for the need to carry out any further investigations (including intrusive boreholes) to address these risk(s).

The CMRA has been undertaken in accordance with the principles of best practice including the Coal Authority's guidance document "Risk Based Approach to Development Management - Resources for Developers Version 3" (2014) (Ref. 1), CIRIA "SP32 Construction over Abandoned Mine Workings" (2002) (Ref. 2) and CIRIA "C758D Abandoned Mine Workings Manual" (2019) (Ref. 3).

The purpose of the CMRA Report is to:

- present a desk-based review of available information on the coal mining issues that are relevant to the application site;
- use that information to identify and assess the risks to the proposed development from coal mining legacy, including the cumulative impact issues;
- set out appropriate mitigation measures to address the coal mining legacy issues affecting the site, including any necessary remedial works and/or demonstrate how coal mining issues have influenced the proposed development; and
- demonstrate to the Local Planning Authority that the application site is, or can be made, safe and stable to meet the requirements of National Planning Policy with regard to development on unstable land.

1.4 Sources of Information

This report is based on current information of past mining activities relevant to the site. The following information sources have been used:

- CON29M Mining Report dated 25th May 2021 (Ref: IT-15370330 **Appendix B**);
- BGS Geoindex geological map;
- BGS geological 1:50,000 England and Wales Sheet 121 Wrexham;
- Groundsolve Ltd 2013: Geotechnical Report, Wern School, Rhos, 14139;
- Coal Authority Interactive Website;
- Historical Ordinance Survey maps.

2 Environmental Setting

2.1 Historic Coal Mining Activity

The development site and surrounding area has been reviewed with reference to historical Ordnance Survey (OS) maps. The history of the site and immediate surrounding area are summarised in Table 1. Copies of the historical OS maps are included in **Appendix C**.

Table 1 - Historic Mapping Review

Date	Scale	Historic Mining Activity
1872	1:10,560	- The site is developed with building of unknown use. - Several surface expressions resembling mine shafts located approximately 300m south and east of the site. - Mine Shaft 470 southwest of the site.
1898	1:10,560	- Old shafts located 160m southeast of the site. - Circular features now marked as old shafts. - Pant Brick Works 600m southwest of the site.
1938	1:10,560	- Surrounding town further developed.

It is assumed that the coal mining features identified on historical maps have been incorporated into the recorded coal mining legacy presented in the CA Consultants Report (**Appendix B**).

2.2 Geological Context

The BGS geological mapping (Geoindex and BGS Sheet 121 Wrexham) show that the site is not directly underlain by superficial deposits but lies close to the edge of a diamicton sheet. Diamicton may therefore be present in limited thickness and generally consists of unsorted clays, silts, sands and gravels.

The bedrock geology is shown to belong to the sandstone facies of the Pennine Lower/ Middle Coal Measures Formation which is of Carboniferous age. The Pennine Lower Coal Measures Formation generally consists of interbedded grey mudstones and siltstones and pale grey sandstones with common coal seams. According to the BGS, the bedrock has a regional dip of 6° towards the east – **See Appendix D**.

The nearest geological fault is located approximately 20m east of the site.

Two BGS borehole logs (ref: SJ24NE44/A and SJ24NE44/D) have been obtained from BGS online records from 20m and 30m south of the site respectively. Borehole SJ24NE44/A shows 3.7m of superficial clay overlying interbedded mudstones and siltstones. Borehole SJ24NE44/D shows 2.40m of superficial clays overlying interbedded mudstones and siltstones. Broken ground was recorded at 18.90m to 19.50m bgl and 19.80m and 20.40m bgl. Old workings were also conjectured between 25.60m and 27.40m bgl.

The Main coal outcrop is shown to be located in close proximity to the site (see **Figure 2**) and is likely to be encountered at shallow depths. Further outcrops of coal are located further to the west. The Main Coal appears to be missing from Coal Authority records.

Using the recorded regional dip of 6° to the east and the trigonometric relationship below, the depth of the coal seam beneath the site can be estimated.

Main Coal (up to 2.30m thick)

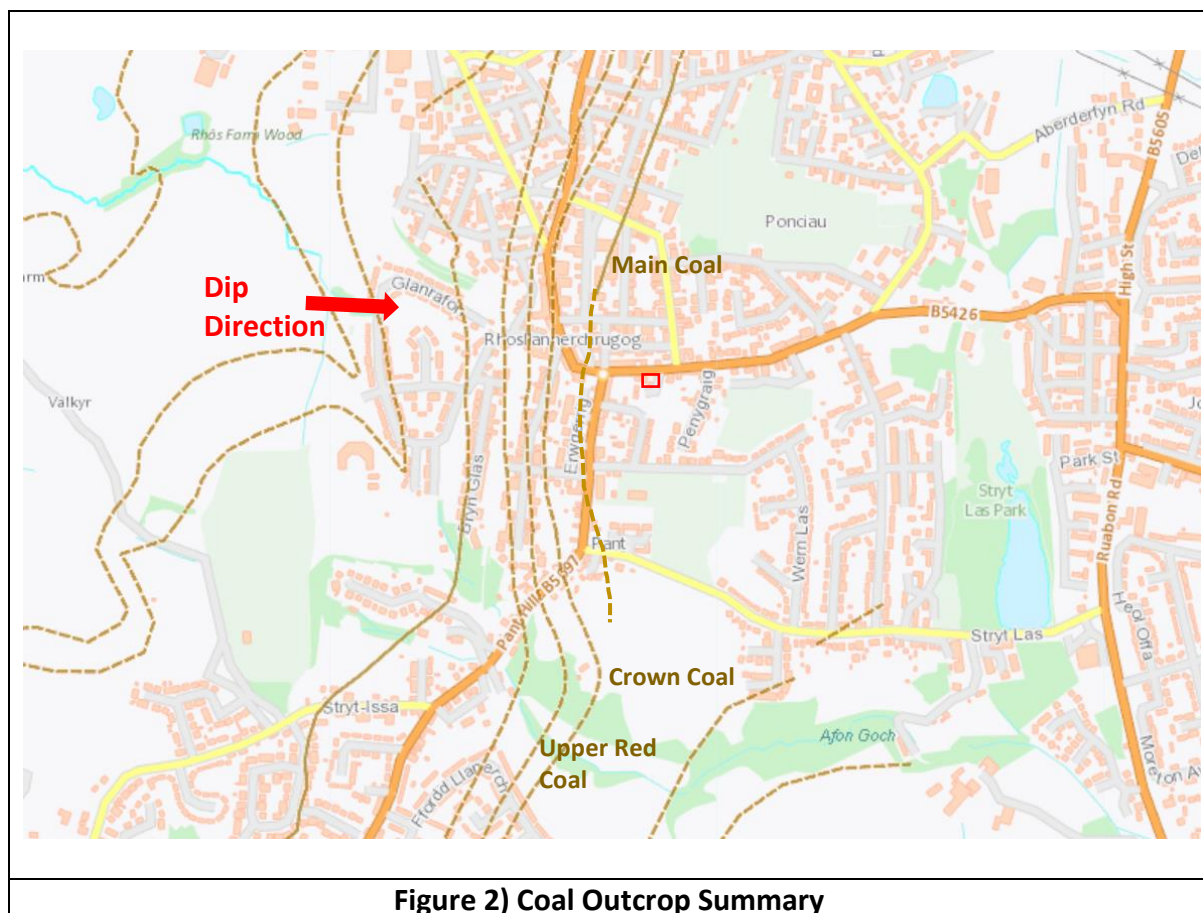
$$\tan 6^\circ \times 110\text{m} + 3.0\text{m (superficial thickness)} - 3.0\text{m (elevation change)} = 11.50\text{m}$$

Crown Coal

$$\tan 6^\circ \times 170\text{m} + 3.0\text{m (superficial thickness)} + 1.0\text{m (elevation change)} = 22.0\text{m}$$

Upper Red Coal

$$\tan 6^\circ \times 210\text{m} + 3.0\text{m (superficial thickness)} + 3.0\text{m (elevation change)} = 28.0\text{m}$$



The site is situated within a Secondary Opencast Coal Resource Area (**Appendix F**). The primary resource area constitutes the main target for opencast coal extraction and comprises a relatively closely spaced succession of variable but generally thick coals. These coals typically occur within a certain discrete stratigraphic interval, which comprises the succession from the middle to upper part of the South Wales and Pennine Lower Coal Measures

formations to the lower part of the South Wales and Pennine Upper Coal Measures formation. Notwithstanding this, it is considered to be very unlikely that there will be any interest in developing open cast coal mining operations at this location in the short or medium-term.

3 Third Party Site Investigations

The site has been subject to previous desk-based studies and intrusive site investigations. EnviroSolution conducted a search of the Local Authority Planning Records for the site and surrounding area. This section aims to summarise the works that have been completed and summarise the main findings.

3.1 Groundsolve Limited. 2013.Geotechnical Report, Wern School, Rhosllanerchrugog. 1413.

The report summarises the findings of a previous ground investigation undertaken at the site by South Lanc Boring of Wigan in 1972. The area of investigation covered the area formerly occupied by a school immediately south of the site referred to in the current report. A mine shaft was searched for and treated. Five boreholes were also drilled across the site.

Groundsolve Limited also undertook a geotechnical ground investigation in 2013 which included:

- Three rotary boreholes drilled to a maximum depth of 23.60m bgl.
- Nine machine dug trial pits excavated to a maximum depth of 4.60m bgl.
- Excavations for mine shafts.

A copy of the report is included in **Appendix H**.

Made Ground was encountered in the majority of the boreholes with a thickness of between 0.70m and 5.40m. It was concluded that the eastern area of the site was used as a tip following the opencast working of the Main Coal. This is shown in Figure 3 of **Appendix H**.

Diamicton was encountered beneath this, generally extending to depths of no greater than 3.70m bgl with the exception of the exploratory hole located within the old tip.

The underlying bedrock strata comprises interbedded mudstones, siltstones and sandstones. A total of 6 no. boreholes of those drilled found evidence of old workings at depth of between 18.90m and 21.0m bgl. The workings were described as 'soft drilling' with 'sight reduction in flush returns'. No voids were recorded, and it was interpreted that the workings had collapsed. **Figure 3** below shows a section across the site. The area of the proposed development considered in this report is indicated.

As part of the investigation works, a mine shaft located along the north-western boundary of the site (southern boundary of the current site) was searched for via excavating to the top of the glacial till. The search was restricted by adjacent properties and the shaft was not located.

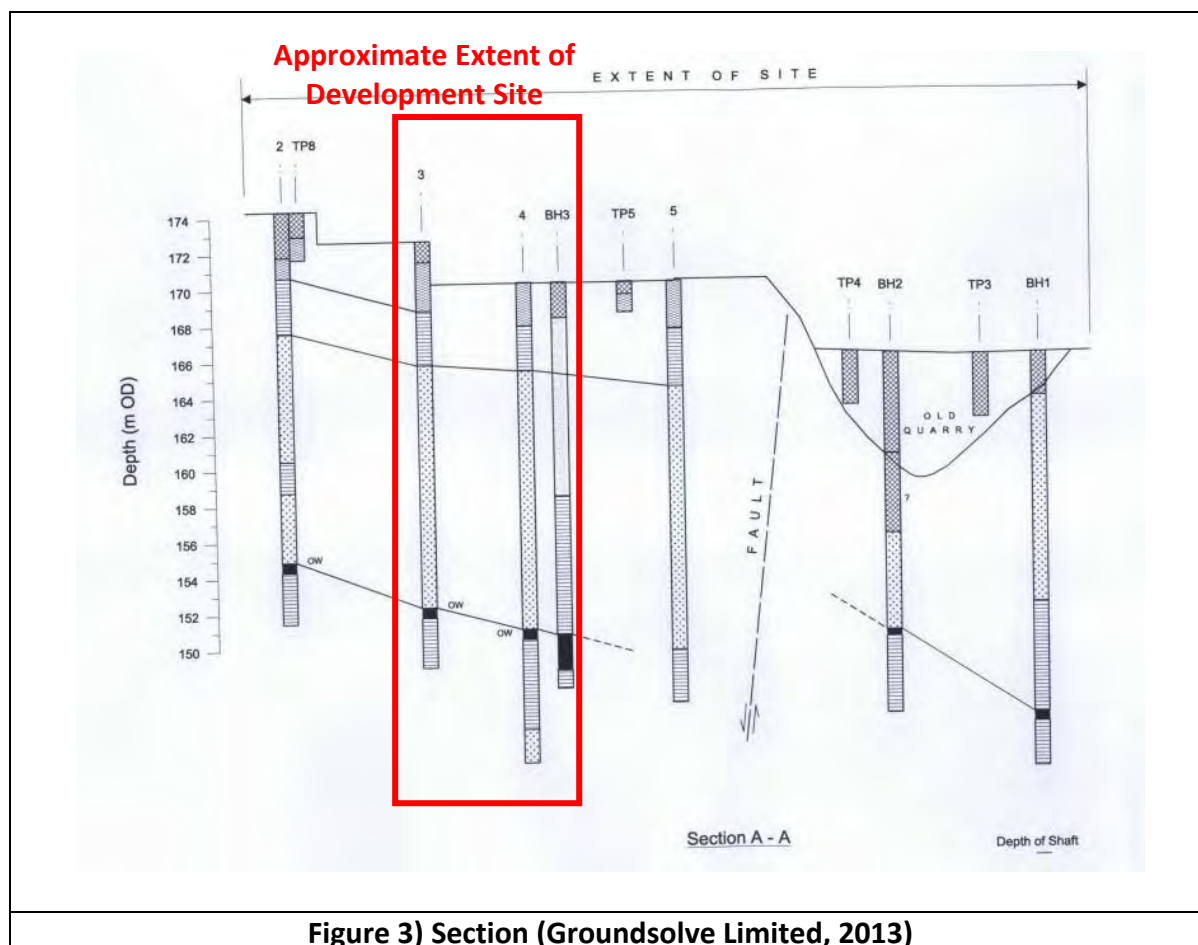


Figure 3) Section (Groundsolve Limited, 2013)

4 Identification and Assessment of Site-Specific Coal Mining Risks

Table 2 below summarises the potential risks associated with coal mining legacy for the proposed development site, which have been identified from list sources of information.

Table 2 - Coal Mining Hazards Summary

Coal Mining Issues	Yes	No
Coal outcrops		X
Underground coal mining (recorded at shallow depths)	X	
Underground coal mining (probable at shallow depths)	X	
Recorded mine entries (shafts and adits)	X	
Unrecorded mine entries (shafts and adits)	X	
Coal mining geology (fissures)		X
Record of past gas emissions		X
Recorded coal mining surface hazard		X
Surface mining (opencast workings)		X

The Coal Authority Interactive Map Viewer (**Appendix G**) has identified that the site lies within a Development High Risk Area associated with the presence of shallow recorded coal workings, the potential for unrecorded shallow coal workings and recorded mine shafts.

The report obtained from the Coal Authority (CON29M Report, reference IT-15370330, dated 25th May 2022) revealed the property is in a surface area that could be affected by recorded underground mining in 3 no. coal seams between shallow depths (less than 30m) and 165m bgl. The seams were last worked in 1866. Records suggest the shallowest of these is likely the Main Coal.

Assuming a competent rock strata thickness equivalent to at least ten times the extraction thickness, provides adequate protection against vertical void migration leading to crown-hole development and surface subsidence (Ref 2 and 3 – See Table 5.1), it is considered that the risk posed by past recorded coal workings cannot be ruled out.

The Coal Authority report also states that the property is in an area where the Coal Authority believe there is coal at or close to the surface which may have been worked in the past. The Coal Authority has drawn attention to this and has stated that the presence of unrecorded shallow coal should be considered. It is considered that if these seams have been worked in the past, they could present a risk of surface instability.

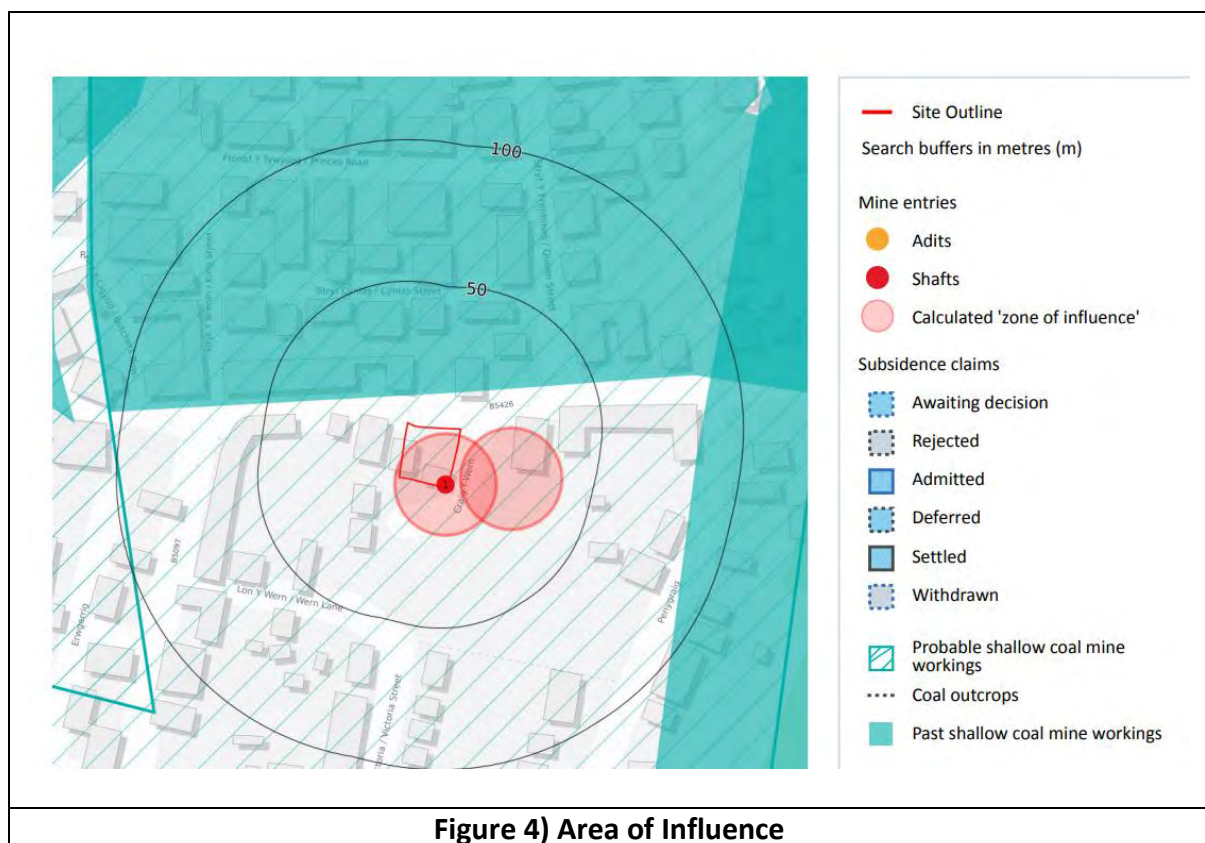
The Coal Authority report states that they are aware of a single. recorded mine entry located within 20m of the development site boundary. The shaft information is summarised in Table 3 below.

Table 3 - Mine Shaft Summary

Shaft Reference	Entry Type	Distance from Site	Assumed Shaft Diameter	Departure
329346-279	Shaft	2m S	2m	10m

The area of influence around the shaft can be estimated by the sum of the diameter, departure, and depth to rockhead. The estimated area of influence is shown in Figure 4 below which shows that the majority of the site falls within this area. Third party site investigation records state that this shaft was searched for via excavations but the search was limited due to property boundaries. It is therefore possible that the shaft is located within the site boundary.

Notwithstanding this, there may also be mine entries in the vicinity that have not been recorded.



The Coal Authority mining report states the property is not within the boundary of a historic or current opencast site, and there are no license requests outstanding to remove coal via this method in the future. The risk posed to the site from opencast mining methods is therefore considered to be negligible.

There are no recorded past mining gas emissions recorded in the surrounding area, however, coal seams and coal mine workings pose a potential gas risk which should be considered in any future investigations and development. At development sites with shallow coal workings, probable shallow coal mine workings, or pathway features such as mine entries and geological disturbances on or nearby the site, it is recommended that a detailed gas risk assessment is undertaken in accordance with relevant guidance.

None of the coal seams referred to above have a particular history of spontaneous combustion, except that there is a general risk where mining methods left a significant thickness of roof coal.

5 Proposed Mitigation Strategy

- A mine shaft has been recorded close to the site boundary. A programme of excavation and trenching should be undertaken in the vicinity of the shaft to locate it and to gain information on its condition.
- It is recommended that up to 3 no. rotary boreholes are advanced to a minimum depth of 30.0m below ground level. Water flush should be used to safeguard against oxidation and potential spontaneous combustion of shallow coal. In order to undertake these works it will be necessary to obtain a drilling permit from The Coal Authority. The monitoring of mine gases will be necessary during the drilling works. Boreholes should also be installed with gas monitoring wells and a programme for gas monitoring should be undertaken.
- If coal is encountered during foundation excavation works, the coal should be over-excavated for a minimum of 1m from the foundations and replaced with blinding concrete. These actions should be adequate to seal the coal from the atmosphere to prevent spontaneous combustion.

6 Conclusions

The Coal Mining Risk Assessment for the site at 11 Hill Street, Rhos, Wrexham in North Wales has concluded that the risk associated with coal mining related issues cannot be ruled out based on information from the Coal Authority and geological interpretation.

The principal risks to the development arise from:

- The presence of recorded shallow mine workings beneath the site;
- the presence of unrecorded shallow mine workings associated with coal seams of workable thickness that are known to be present beneath the site area;
- the potential presence of coal at or close to the surface which could intersect proposed building foundations;
- recorded mine entries;
- unrecorded mine entries;
- mine gas.

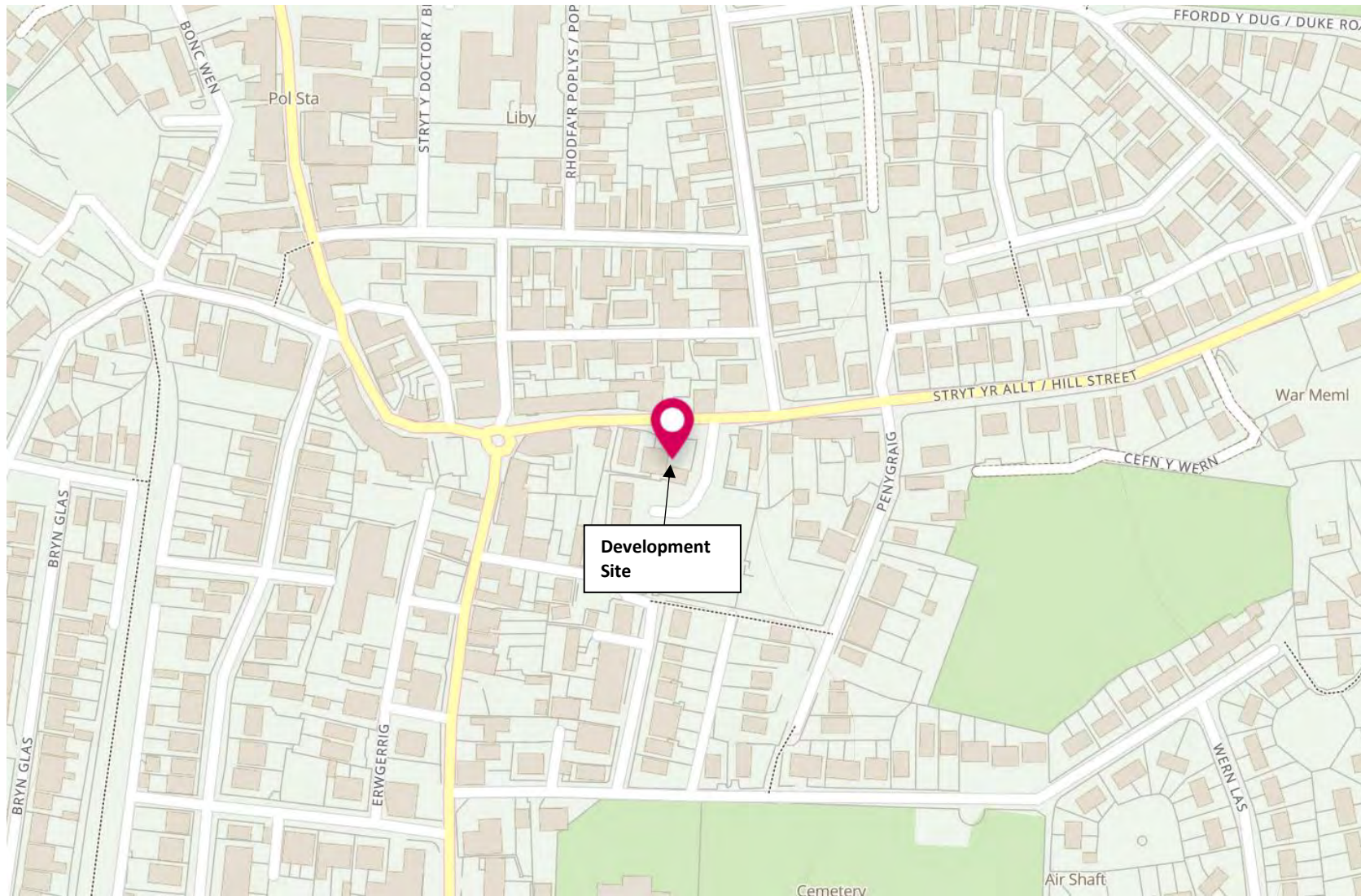
It is therefore recommended that further intrusive ground investigations are undertaken. These might include trial trenching in the area of the mine shaft and the drilling of a up to 3 no. rotary probe borehole(s) close to the proposed development to determine the superficial thickness along with obtaining evidence of potential unrecorded coal mine workings.

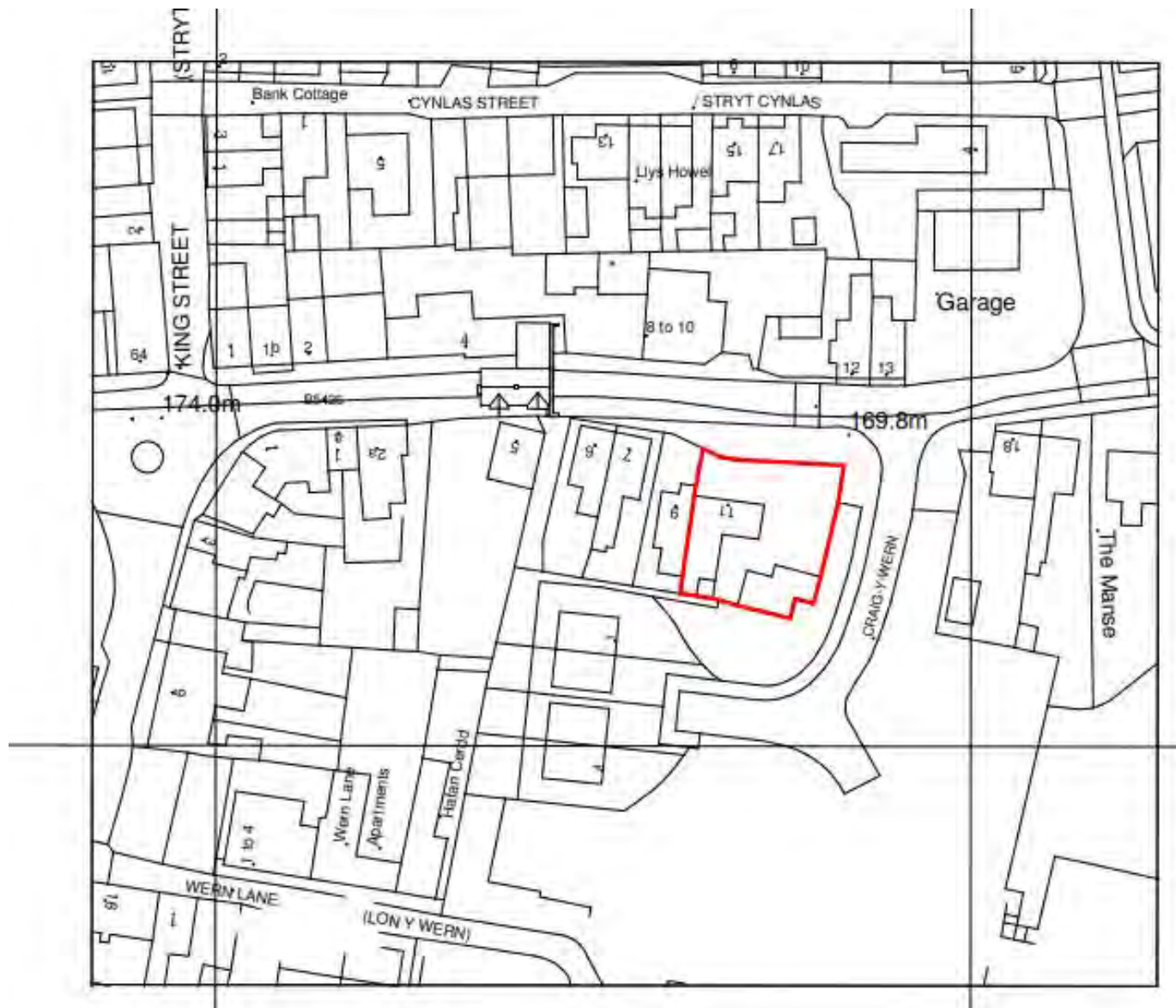
Prior to the commencement of intrusive works, a Coal Authority Permit will be required for drilling activities, that will disturb or enter any coal seams, coal mine workings or coal mine entries (shafts and adits). The scope of works for the investigation will need to be submitted and approved by the local authority prior to the commencement of the intrusive works.

7 References

1. Coal Authority, 2014, Risk Based Approach to Development Management Resources for Developers, Version 3.
2. CIRIA, 2002, SP32 Construction over Abandoned Mine Workings.
3. CIRIA, 2019, C758D Abandoned Mine Workings Manual.
4. CIRIA, Publication C665, Assessing risks posed by hazardous ground gases to buildings.

Appendix A – Site Location







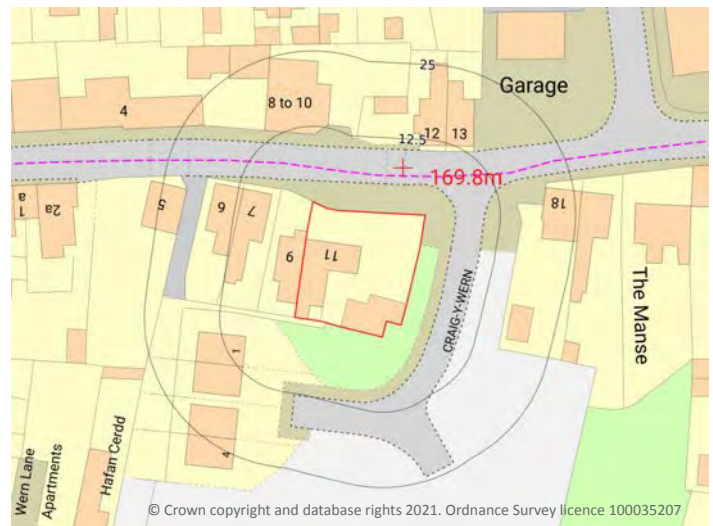
Appendix B – Coal Authority Report

11, Stryt Yr Allt, Rhosllanerchrugog, Wreccsam, LL14 1LN

Professional opinion

Inc. integrated mine entry interpretive assessment

Site plan



Search results

- | | | | | |
|--|--|--------|---|---|
|  | 1. Past underground coal mining
Identified | page 5 |  | 7. Present opencast coal mining
Not identified |
|  | 2. Present underground coal mining
Not identified | |  | 8. Future opencast coal mining
Not identified |
|  | 3. Future underground coal mining
Not identified | |  | 9. Coal mining subsidence claims
Not identified |
|  | 4. Shafts and adits (mine entries)
Identified | page 6 |  | 10. Mine gas emissions
Not identified |
|  | 5. Coal mining geology
Not identified | |  | 11. Emergency Call Out incidents
Not identified |
|  | 6. Past opencast coal mining
Not identified | |  | Cheshire Brine
Not identified |

Coal mining (CON29M) assessment

We consider there to be a potential risk to the property from past coal mining activity. For further details refer to: Past underground coal mining, Shafts and adits (mine entries).



Coal mining

Shafts and adits (mine entries)

A record of a mine entry or entries has been identified within 20 metres of the property. Additionally the zone of influence of a mine entry has been calculated to encroach into the property. Please see map on **page 4**.

It is our opinion that as the mine entry itself is likely to be outside of the property boundary a site investigation to clarify its exact condition and location is unlikely to be a viable option and that no further remote searches would be of value.

Next steps for consideration:

- Please read on for details on Coal Authority responsibilities in the event of subsidence issues relating to this mine entry, and also refer to the Shafts and adits (mine entries) section on **page 6** for further details.

In the event of damage resulting from the subsidence or settlement of this mine entry, property owners can make a claim against the mine owner or responsible person (usually The Coal Authority) under the provisions of the Coal Mining Subsidence Act 1991. The mine owner or responsible person will treat the mine entry and arrange for repairs to the property to be carried out to the reasonable satisfaction of the owner.

Past underground coal mining

Potential risk due to past underground coal mining has been identified within the boundary of the property. Whilst no further searches are required, it should be noted that in the event of coal mining settlement or subsidence occurring the property will benefit from the protection of the Coal Mining Subsidence Acts of 1991 and as amended 1994.

Next steps for consideration:

- A visual inspection of the property by a suitably qualified and experienced person may be of value in identifying any currently identifiable mining related settlement or subsidence effects.

Coal Mining Subsidence Act 1991

If any coal mining subsidence damage has occurred, as determined by the appropriate persons/bodies, the property will benefit from the protection of the Coal Mining Subsidence Acts of 1991 and as amended 1994.

This Act, however, 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 this instance it would be prudent to have the property visually inspected for signs of mining related settlement or subsidence by a suitably qualified and experienced person, who could be sought through <https://www.ricsfirms.com/>.



The Coal Authority provide a call out service on 01623 646 333 to take remedial action concerning the movement or collapse of any coal entries or coal mining surface hazards. Further details can be found on www.groundstability.com.

CON29M reports are a requirement for conveyancing and are recommended throughout the official Coal Mining Reporting Area. This is the area within which it is deemed prudent to clarify the risk presented by coal mining, using the questions laid out in the Law Society's CON29M form. The need for a CON29M does not always translate to an identification of risk, and reports will often be assessed as free from risk or 'Passed' even though they are within the official Coal Mining Reporting Area.

Development risk

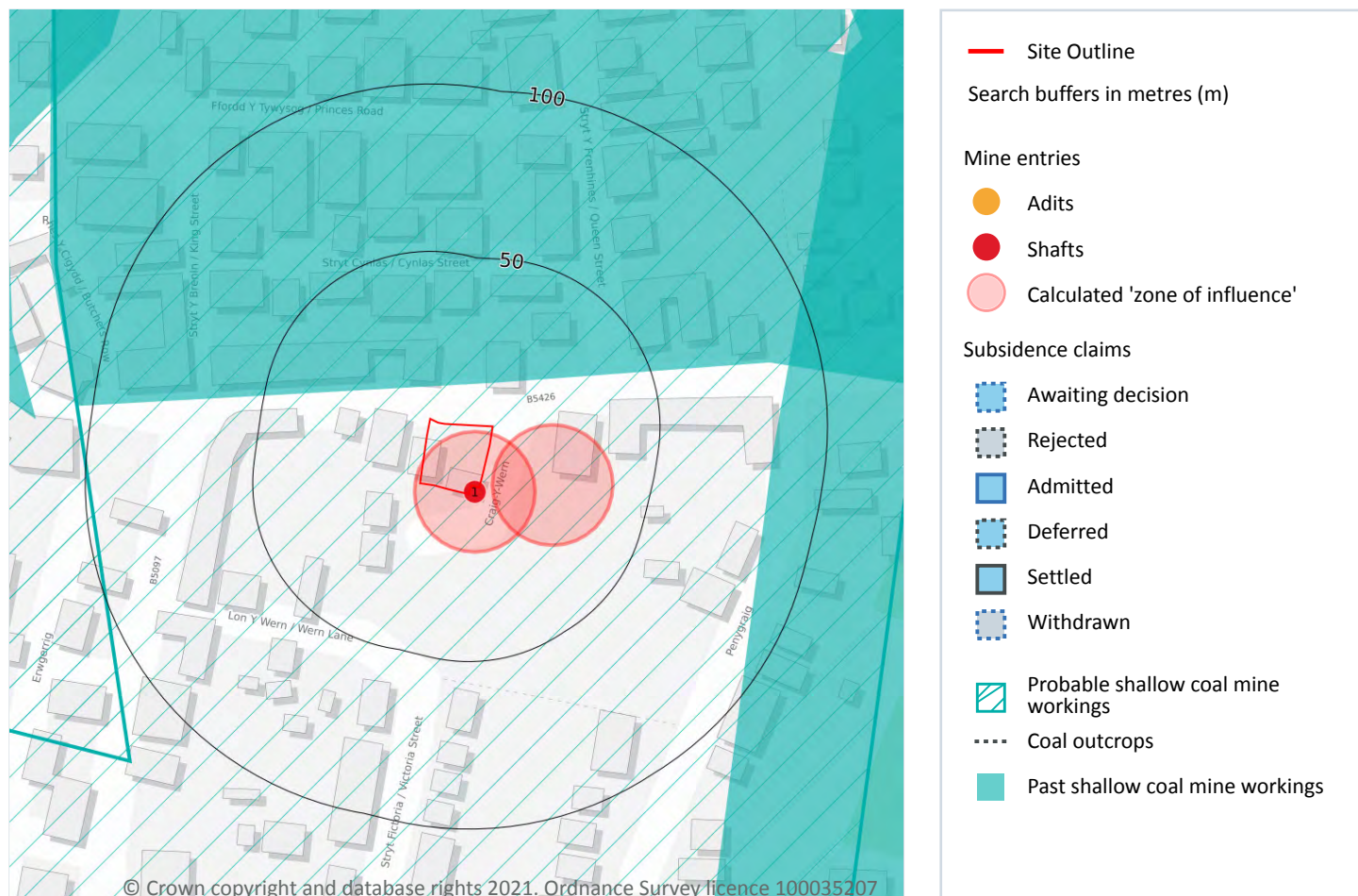
In view of the mining circumstances a prudent developer would seek appropriate technical advice before any works are undertaken.

Therefore if development proposals are being considered, technical advice relating both to 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.

This report provides an overall assessment on risk to property from coal mining hazards alongside responses to The Law Society CON29M Coal Mining search enquiries. The CON29M questions and format are used here with permission of The Law Society, and the report is prepared in accordance with The Law Society CON29M (2018) Guidance Notes. The overall assessment and individual question responses have been produced using official Coal Authority data and the expert interpretation of Groundsure and Mining Searches UK.

Coal mining (CON29M)



The map above shows relevant, mappable hazards identified that could constitute a risk to the property. It does not necessarily show all features or potential issues identified in this report.

Please read this report carefully, and in particular any sections flagged with an amber 'i'.

Further details of any features shown indicating the location of Mine Entries or Subsidence Claims can be found in the relevant sections of this report (4 and 9 respectively).

The following are responses to The Law Society CON29M Coal Mining search enquiries, which are used here with their permission. All responses have been produced using official Coal Authority data and the expert interpretation of Groundsure and Mining Searches UK. This report is prepared in accordance with The Law Society CON29M (2018) Guidance Notes. Additional interpretation and calculation of mine entry zones of influence has been carried out by Groundsure and Mining Searches UK using Coal Authority and British Geological Survey data.

1. Past underground coal mining



Is the property within the zone of likely physical influence on the surface of past underground coal workings?

- The property lies within the potential zone of influence of recorded workings in 3 seam(s) of coal. The most recent underground working in the area was in 1866. Workings lie between a shallow depth and 165 metres below surface.
- The property is indicated to lie in an area where coal deposits have been worked at shallow depth in the past but for which no plan exists.

2. Present underground coal mining



Is the property within the zone of likely physical influence on the surface of present underground coal workings?

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

3. Future underground coal mining



(a) Is the property within any geographical area for which the Coal Authority is determining whether to grant a licence to remove coal by underground methods?

- The property does not lie within the boundary of an underground site for which the Coal Authority is determining whether to grant a licence to remove coal by underground methods.

(b) Is the property within any geographical area for which a licence to remove coal by underground methods has been granted?

- The property does not lie within the boundary of an underground site for which a licence to remove coal by underground methods has been granted.

(c) Is the property within the zone of likely physical influence on the surface of planned future underground coal workings?

- The property does not lie within the zone of likely physical influence on the surface of planned future underground workings.

(d) Has any notice of proposals relating to underground coal mining operations been given under section 46 of the Coal Mining Subsidence Act 1991?

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

4. Shafts and adits (mine entries)



Are there any shafts and adits or other entries to underground coal mine workings within the property or within 20 metres of the boundary of the property?

- Coal mine entries are recorded to lie within 20 metres of the property.

ID	Distance	Details	Dimensions	Treatment
1	2 m	Type: Shaft Mineral: Coal Reference: 329346-279 Name: NORTH WALES Owner: CA	Assumed diameter (m): 2 Confirmed diameter (m): - Depth (m): - Accuracy (m): 10 Source: Other: Plan of estate of Hon F. West - 1826.	Details: - Date: -

5. Coal mining geology



Is there any record of any fault or other line of weakness due to coal mining at the surface within the boundary of the property that has made the property unstable?

- No damage arising from geological faults or other lines of weakness activated by coal mining are recorded within the property.

6. Past opencast coal mining



Is the property situated within the geographical boundary of an opencast site from which coal has been removed in the past by opencast methods?

- The property does not lie within the boundary of an opencast site from which coal was removed by opencast methods.

7. Present opencast coal mining



Is the property within 200 metres of the boundary of an opencast site from which coal is being removed by opencast methods?

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

8. Future opencast coal mining



(a) Is the property within 800 metres of the boundary of an opencast site for which the Coal Authority are determining whether to grant a licence to remove coal by opencast methods?

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

(b) Is the property within 800 metres of the boundary of an opencast site for which a licence to remove coal by opencast methods has been granted?

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

9. Coal mining subsidence claims



(a) Has any damage notice or claim for alleged coal mining subsidence damage to the property been given, made or pursued since 31st October 1994?

- **We have no evidence of a damage notice or subsidence claim for the property or within 50m of the property since 31st October 1994.**

(b) In respect of any such notice or claim has the responsible person given notice agreeing that there is a remedial obligation or otherwise accepted that a claim would lie against them?

- **Not applicable.**

(c) In respect of any such notice or acceptance has the remedial obligation or claim been discharged?

- **Not applicable.**

(d) Does any current "Stop Notice" delaying the start of remedial works or repairs affect the property?

- **There are no current Stop Notices delaying the start of remedial works or repairs to the property.**

(e) Has any request been made under Section 33 of the 1991 Act to execute preventive works before coal is worked, which would prevent the occurrence or reduce the extent of subsidence damage to any buildings, structures or works and, if yes, has any person withheld consent or failed to comply with any such request to execute preventive works?

- **There is no record of a request that has been made to carry out preventive works before coal is worked under Section 33 of the Coal Mining Subsidence Act 1991.**

NB. Records of damage notices or subsidence claims before 31st October 1994 are excluded from The Coal Authority data from which this search is compiled.

10. Mine gas emissions



Does the Coal Authority have record of any mine gas emission within the boundary of the property being reported that subsequently required action by the Authority to mitigate the effects of the mine gas emission?

- No mine gas emissions are recorded within the boundary of the property.

11. Emergency Surface Hazard Call Out incidents



Have the Coal Authority carried out any work on or within the boundaries of the property following a report of an alleged hazard related to coal mining under the Authority's Emergency Surface Hazard Call Out procedures?

- No Emergency Surface Hazard Call Out procedures are recorded against the property.

CON29M notes and guidance

These enquiries are The Law Society CON29M (2018) Coal Mining search enquiries and are used with permission of The Law Society. The Law Society CON29M Coal Mining search enquiries are protected by copyright owned by The Law Society of 113 Chancery Lane, London WC2A 1PL. The Law Society has no responsibility for information provided in response to CON29M (2018) Coal Mining search enquiries within this report or otherwise.

This report is prepared in accordance with The Law Society Guidance Notes 2018; under which all replies to these enquiries are made. Groundsure's Terms and Conditions are applicable at the time the report was produced.

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 obligations of either the Coal Authority or other responsible persons under the 1991 Act can be obtained by telephoning 0345 762 6848. Further information can be found on their website: www.groundstability.com.

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).

The Coal Authority emergency telephone number at all times is 01623 646333.

Responses to The Law Society CON29M (2018) Coal Mining Search enquiries and associated findings and recommendations relating to coal mining risk have been provided to Groundsure Ltd by Cornwall Mining Searches Limited T/A Mining Searches UK. Groundsure Ltd have additionally provided information relating to the Cheshire Brine Compensation Area, and have compiled all information into this report.

Queries should be made of Groundsure Ltd on 0844 415 9000, or via email: info@groundsure.com.

CON29M report limitations

This CON29M (2018) Coal Mining Report has been carried out with reference to all available official Coal Authority licensed data, an extensive collection of abandoned mine plans, maps and records. From this material, we have endeavoured to provide as accurate a report as possible. Any and all analysis and interpretation of licensed Coal Authority data in this report is made by Cornwall Mining Services Limited T/A Mining Searches UK.

The information provided in this report by Groundsure Ltd / Cornwall Mining Services Limited T/A Mining Searches UK has been compiled in response to The Law Society CON29M (2018) Coal Mining search enquiries. The scope of the assessment is limited to interpretation of past, present and future extraction of coal, and does not consider the impact from non-coal mining hazards and/or natural ground stability hazards. The Law Society's Guidance Notes 2018 recommends separate enquiries to the appropriate sources are made with regard to other minerals.

The Report is created by a remote investigation and reviews only information provided by the client (address and site location boundaries) and from the databases of publicly available and/or licensable information that

enable a desk-based assessment of the Site. The Report does not include a Site Investigation, nor does Groundsure Ltd / Cornwall Mining Services Limited T/A Mining Searches UK make additional specific information requests of the regulatory authorities for any relevant information they may hold.

This report is concerned solely with the Site searched and should not be used in connection with nearby properties, as only known coal mining features that could potentially have a direct influence upon the Site searched are considered relevant; other features present in the general area may have been omitted for ease of reference.

This report is confidential to the client, the client's legal advisor and the client's Mortgage lender, as defined in the Groundsure terms & conditions, and as such may be used by them for conveyancing or related purposes. Groundsure has no liability toward any person or organisation not party to commissioning this report. This report or any part of it is not permitted to be reproduced, copied, altered or in any other way distributed by any other person or organisation.

Additional mine entry assessment is based on and limited to the data supplied by the Coal Authority at the time of production. In order to determine whether a property is within the likely zone of influence of a disused coal mine entry the following is considered: the actual or plotted position of the mine entry, its known or assumed diameter and the thickness of superficial deposits above rockhead. Where these figures are not known, assumptions based on established estimations have been made.

CON29M report licensing

This report contains Data provided by the Coal Authority. Any and all analysis and interpretation of Coal Authority Data in this report is made by Cornwall Mining Services Limited T/A Mining Searches UK and is in no way supported, endorsed or authorised by the Coal Authority. The use of the data is restricted to the terms and provisions contained in this report. Data reproduced in this report may be the copyright of the Coal Authority and permission should be sought from Groundsure Ltd / Cornwall Mining Services Limited T/A Mining Searches UK prior to any re-use.

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This report may contain public sector information licensed under the Open Government Licence v3.0.

This report may contain plans and records held by the Coal Authority and made publicly available at the time of inspection which may include British Geological Survey and Ordnance Survey data.

Conveyancing Information Executive and our terms & conditions

IMPORTANT CONSUMER PROTECTION INFORMATION

This search has been produced by Groundsure Ltd, Sovereign House, Church Street, Brighton, BN1 1UJ. Tel: 08444 159 000. Email: info@groundsure.com. Groundsure adheres to the Conveyancing Information Executive Standards.

The Standards

- Conveyancing Information Executive Members shall act in a professional and honest manner at all times in line with the Conveyancing Information Executive Standards and carry out the delivery of the Search with integrity and due care and skill.
- Compliance with the Conveyancing Information Executive Standards will be a condition within the Conveyancing Information Executive Member's Terms and Conditions.
- Conveyancing Information Executive Members will promote the benefits of and deliver the Search to the agreed standards and in the best interests of the customer and associated parties.

Complaints Advice

If you have a query or complaint about your search, you should raise it directly with the search firm, and if appropriate ask for any complaint to be considered under their formal internal complaints procedure.

If you remain dissatisfied with the firm's final response, after your complaint has been formally considered, or if the firm has exceeded the response timescales, you may refer your complaint for consideration under The Property Ombudsman scheme (TPOs). The Ombudsman can award up to £5,000 to you if the Ombudsman finds that you have suffered actual financial loss and/or aggravation, distress or inconvenience as a result of your search provider failing to keep to the Standards.

Please note that all queries or complaints regarding your search should be directed to your search provider in the first instance, not to TPOs.

COMPLAINTS PROCEDURE: If you want to make a complaint, we will:

- acknowledge it within 5 working days of receipt
- normally deal with it fully and provide a final response, in writing, within 20 working days of receipt
- liaise, at your request, with anyone acting formally on your behalf

Complaints should be sent to:

Operations Director, Groundsure Ltd, Sovereign House, Church Street, Brighton, BN1 1UJ. Tel: 08444 159 000. Email: info@groundsure.com If you are not satisfied with our final response, or if we exceed the response timescales, you may refer the complaint to The Property Ombudsman scheme (TPOs): Tel: 01722 333306, E-mail: admin@tpos.co.uk We will co-operate fully with the Ombudsman during an investigation and comply with their final decision.

Groundsure's Terms and Conditions can be viewed online at this link: <https://www.groundsure.com/terms-and-conditions-jan-2020/>

Important consumer protection information

All of the advice and reports that Groundsure produces are covered by a comprehensive Remediation Contribution policy to ensure customers are protected, see <https://www.groundsure.com/remediation> for full details.

Data providers

Groundsure works with respected data providers to bring you the most relevant and accurate information in your report. To find out who they are and their areas of expertise see <https://www.groundsure.com/sources-reference>.

Coal Mining Report Insurance Policy



Coal Mining Report Insurance Policy

The Schedule

Policy Number: The Reference contained in the **Coal Mining Search Report**

Premium: £1.40 inclusive of Insurance Premium Tax at 12%

Property: The property which is the subject of the **Coal Mining Search Report**

Limit of Indemnity: £100,000 increasing by 10% compound per annum on each anniversary of and for the first 10 years following the **Commencement Date**

Commencement Date: The date of the **Coal Mining Search Report**

You/Your:

1. A purchaser of the **Property**
2. A lender providing a **Mortgage** in connection with a purchase of the **Property**
3. A lender providing a **Mortgage** by way of a re-mortgage of the **Property**

Definitions

Where a word is defined below or in the schedule it shall carry the same meaning wherever it appears in bold text in this policy

Insured Use: The continued use of the **Property** as a single house or flat or a single commercial premises

Market Value: The value as determined by a surveyor appointed by agreement between **You** and **Us** or (in default of agreement) the President for the time being of the Royal Institution of Chartered Surveyors

Mortgage: A mortgage or charge secured on the **Property** by an institutional mortgage lender

Coal Mining Search Report: The coal mining search report attached to this policy

Search: An official search comprising a search in form CON29M (2018) being mining searches relating to coal and brine in the area in which the **Property** is situated

We/Our/Us:

Zurich Insurance plc. A public limited company incorporated in Ireland. Registration No. 13460. Registered Office: Zurich House, Ballsbridge Park, Dublin 4, Ireland. UK Branch registered in England and Wales Registration No. BR7985. UK Branch Head Office: The Zurich Centre, 3000 Parkway, Whiteley, Fareham, Hampshire PO15 7JZ.

Zurich Insurance plc is authorised by the Central Bank of Ireland and authorised and subject to limited regulation by the Financial Conduct Authority. Details about the extent of our authorisation by the Financial Conduct Authority are available from us on request. Our FCA Firm Reference Number is 203093.

Communications may be monitored or recorded to improve our service and for security and regulatory purposes.

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Your Policy

This is a legal document and should be kept in a safe place.

This policy is an agreement between **You** and **Us** and cover is provided subject to the payment of the **Premium**.

You must read this policy and its conditions, exclusions, schedule and any endorsements as one contract. Please read all of them to make sure that they provide the cover **You** require. If they do not, please contact **Us** or **Your** insurance adviser who arranged the policy for **You**.

When **You** take out and make changes to the cover provided by this policy, **You** must take reasonable care to ensure that **You** accurately answer any questions which **We** ask of **You** and that any information **You** give **Us** is accurate. If **You** are taking out this policy for purposes which are mainly related to **Your** trade, business or profession, **You** must also let **Us** know about all facts which are material to **Our** decision to provide **You** with insurance. Failure to meet these obligations could result in this policy being invalidated, a claim not being paid, or an additional premium being charged.

Fair presentation of the risk

a) At inception of this policy and also whenever changes are made to it at **Your** request **You** must:

- i) where **You** have taken out this policy for purposes which are wholly or mainly related to **Your** trade, business or profession, disclose to **Us** all material facts in a clear and accessible manner and not misrepresent any material facts, and
- ii) where **You** have taken out this policy for purposes which are wholly or mainly unrelated to **Your** trade, business or profession, take reasonable care not to misrepresent any material facts.

b) If **You** do not comply with clause a) of this condition **We** may:

- i) avoid this policy which means that **We** will treat it as if it had never existed and refuse all claims where any non-disclosure or misrepresentation by **You** is proven by **Us** to be deliberate or reckless in which case **We** will not return the premium paid by **You**; and
- ii) recover from **You** any amount **We** have already paid for any claims including costs or expenses **We** have incurred.

c) If **You** do not comply with clause a) of this condition and the non-disclosure or misrepresentation is not deliberate or reckless this policy may be affected in one or more of the following ways depending on what **We** would have done if **We** had known about the facts which **You** failed to disclose or misrepresented:

- i) if **We** would not have provided **You** with any cover **We** will have the option to:
 1. avoid the policy which means that **We** will treat it as if it had never existed and repay the premium paid; and
 2. recover from **You** any amount **We** have already paid for any claims including costs or expenses **We** have incurred
- ii) if **We** would have applied different terms to the cover **We** will have the option to treat this policy as if those different terms apply. **We** may recover any payments made by **Us** on claims which have already been paid to the extent that such claims would not have been payable had such additional terms been applied
- iii) if **We** would have charged **You** a higher premium for providing the cover **We** will charge **You** the additional premium which **You** must pay in full.

d) If any insured person, other than **You**, is responsible for a misrepresentation or failure to make a fair presentation of the risk, **We** will invoke the remedies available to **Us** under this condition as against that particular person as if a separate insurance contract had been issued to them leaving the remainder of the policy unaffected.

NB: For the purposes of the duty of disclosure stated in paragraphs a) i) and ii) above the content of the **Coal Mining Search Report** will be deemed to satisfy **Your** disclosure obligations.

Cover

1. **You** are in the process of purchasing the **Property** relying on the **Coal Mining Search Report** and/or
2. **You** (being a lender) have agreed to provide a **Mortgage** in connection with **Your** borrower's purchase or re-mortgage of the **Property** relying on the **Coal Mining Search Report**.

We will pay the following losses sustained by **You** arising out of the **Property** being affected by any matter which would have been revealed by a **Search** had one been carried out on the date of the **Coal Mining Search Report** but which was not revealed by the **Coal Mining Search Report**:

1. any reduction in **Market Value** of the **Property** calculated at the date **You** become aware of the matter(s) and/or loss in connection with a **Mortgage** as a result of such reduction.
2. all other costs and expenses including out of court settlement costs incurred by **Us** or by **You** with **Our** prior written agreement.

Waiver of Breach of Policy Condition

We will not exercise **Our** right to avoid **Our** liability to **You** in respect of loss where **You** have inadvertently breached any term or condition of the policy provided that such breach does not prejudice **Our** rights and remedies under the policy or otherwise directly or indirectly result in or increase the amount of any loss.

Protection for Mortgagees and Successors in Title

We will not avoid **Our** liability to make a payment to **You** solely because another person breaches the terms and conditions of this policy, provided such breach was not committed on **Your** behalf or with **Your** agreement, and **We** will invoke the remedies available to **Us** under the Policy as against that other person as if a separate insurance contract had been issued to them leaving the remainder of the policy unaffected.

Joint Insured

Any party insured under this policy standing in the relation of parent company, subsidiary company, associated company, branch office or joint venture partner to each other will be deemed to be joint insured for the purposes of this policy and jointly liable and responsible for any breach of any terms and conditions of this policy. If there is any inconsistency between this clause and any other term of this policy, this clause shall prevail.

Exclusions

We will not pay for any:

1. amount in excess of the **Limit of Indemnity**.
2. loss which would be recoverable under a household buildings insurance policy.
3. loss arising from any matter that **You** were aware of at the **Commencement Date**.
4. loss if the **Property** is used for any purpose other than the **Insured Use**.

Claims Conditions and How to Claim

1. **You** must:

- i) give **Us** written notice as soon as possible of any potential or actual claim or any circumstances likely to result in a claim. Please provide the policy number, **Your** name, the full address of the **Property** and a brief description of the incident that has occurred. Notifications should be sent to: Speciality Lines Claims Team, Zurich Insurance, 8th Floor, 70 Mark Lane, London, EC3R 7NQ. Email: claims@uk.zurich.com, Enquiry line: telephone 0207 648 3523
- ii) pass all court documents and/or other communications to **Us** as soon as possible after receipt
- iii) not deal with, make any admission of liability or attempt to settle a claim without **Our** prior written agreement.
- iv) agree to and carry out at **Our** expense all things necessary to minimise any loss.
- v) provide all information and assistance that **We** may require to help defend and settle the claim.

2. **We** are entitled to:

- i) decide how to settle or defend a claim and may carry out proceedings in the name of any person insured under this policy, including proceedings for recovering any claim.
- ii) pay to **You** at any time, an amount equal to the **Limit of Indemnity** or any lower amount for which the claim can be settled, after deduction of any sum already paid. **We** may then give up control of and have no further liability in connection with the claim.

3. If **We** admit liability for a claim but there is a dispute as to the amount to be paid the dispute will be referred to an arbitrator. The arbitrator will be appointed jointly by **You** and **Us** in accordance with the law at the time. **You** may not take any legal action against **Us** over the dispute before the arbitrator has reached a decision.

4. If **You** or anyone acting on Your behalf:



- a) makes a fraudulent or exaggerated claim under this policy; or
- b) uses fraudulent means or devices including the submission of false or forged documents in support of a claim whether or not the claim is itself genuine; or
- c) makes a false statement in support of a claim whether or not the claim is itself genuine; or
- d) submits a claim under this policy for loss or damage which **You** or anyone acting on **Your** behalf or in connivance with **You** deliberately caused; or
- e) realises after submitting what **You** reasonably believed was a genuine claim under this policy and then fails to tell **Us** that **You** have not suffered any loss or damage; or
- f) suppresses information which **You** know would otherwise enable **Us** to refuse to pay a claim under this policy

We will be entitled to refuse to pay the whole of the claim and recover any sums that **We** have already paid in respect of the claim.

If any fraud is perpetrated by or on behalf of an insured person and not on behalf of **You** this condition should be read as if it applies only to that insured person's claim and references to this policy should be read as if they were references to the cover effected for that person alone and not to the policy as a whole.

5. If any claim is covered by any other insurance, **We** will not pay for more than **Our** share of that claim.

6. The most **We** will pay for any loss (or all losses in the aggregate), including costs and expenses agreed by **Us** is the **Limit of Indemnity**. Once **We** have paid a loss or losses equal to the amount of the **Limit of Indemnity**, **We** will have no further liability under this policy.

General Conditions

1. Neither **You** (nor anyone acting on **Your** behalf) must disclose the existence of this policy to any other party except **Your** legal and other professional advisers, prospective purchasers, lessees and tenants of the **Property**, their respective mortgagees, legal and other professional advisers.

2. In the UK the law allows both **You** and **Us** to choose the law applicable to the contract. This contract will be subject to the relevant law of England and Wales, Scotland, Northern Ireland, the Isle of Man or the Channel Islands depending upon the **Property** address stated in the Schedule. If there is any dispute as to which law applies it will be English law. The parties agree to submit to the exclusive jurisdiction of the English courts.

3. Notwithstanding any other terms of this policy **We** will be deemed not to provide cover nor will **We** make any payment or provide any service or benefit to **You** or any other party to the extent that such cover, payment, service, benefit and/or any business or activity of **Yours** would violate any applicable trade or economic sanctions law or regulation.

Cancellation Clause

If **You** have taken out this policy for purposes which are wholly or mainly unrelated to **Your** trade, business or profession, **You** may cancel this policy within 14 days of receiving the policy by writing to **Us** and in such event **We** may, at **Our** discretion, charge **You** for the time that **You** have been on cover. Any refund will be made to the party who paid the premium. If **You** do cancel, **You** may be in breach of the terms of **Your** mortgage or the terms of the contract for the sale of **Your** property. If **You** are in doubt, **You** may wish to seek legal advice prior to cancellation.

Fair Processing and Complaints Procedure Our Complaints Procedure

Our commitment to customer service

We are committed to providing a high level of customer service. If you feel we have not delivered this, we would welcome the opportunity to put things right for you.

Who to contact in the first instance

Many concerns can be resolved straight away. Therefore in the first instance, please get in touch with your usual contact at Zurich or your broker or insurance intermediary, as they will generally be able to provide you with a prompt response to your satisfaction.

Contact details will be provided on correspondence that we or our representatives have sent you.

Many complaints can be resolved within a few days of receipt

If we can resolve your complaint to your satisfaction within the first few days of receipt, we will do so. Otherwise, we will keep you updated with progress and will provide you with our decision as quickly as possible.

Next steps if you are still unhappy

If you are not happy with the outcome of your complaint, you may be able to ask the Financial Ombudsman Service to review your case.

We will let you know if we believe the ombudsman service can consider your complaint when we provide you with our decision. The service they provide is free and impartial, but you would need to contact them within 6 months of the date of our decision.

More information about the ombudsman and the type of complaints they can review is available via their website www.financial-ombudsman.org.uk.

You can also contact them as follows:

Post: Financial Ombudsman Service, Exchange Tower, London, E14 9SR

Telephone: 08000 234567 (free on mobile phones and landlines)

Email: complaint.info@financial-ombudsman.org.uk

If the Financial Ombudsman Service is unable to consider your complaint, you may wish to obtain advice from the Citizens Advice Bureau or seek legal advice.

The Financial Services Compensation Scheme (FSCS)

We are covered by the Financial Services Compensation Scheme (FSCS) which means that you may be entitled to compensation if we are unable to meet our obligations to you. Further information is available on www.fscs.org.uk or by contacting the FSCS directly on 0800 678 1100.

How we use your information

Who controls your personal information

This notice tells you how Zurich Insurance plc ('Zurich'), as data controller, will deal with your personal information. Where Zurich introduces you to a company outside the group, that company will tell you how your personal information will be used.

You can ask for further information about our use of your personal information or complain about its use in the first instance, by contacting our Data Protection Officer at: Zurich Insurance Group, Tri-centre 1, Newbridge Square, Swindon, SN1 1HN or by emailing the Data Protection Officer at GBZ.General.Data.Protection@uk.zurich.com.

If you have any concerns regarding our processing of your personal information, or are not satisfied with our handling of any request by you in relation to your rights, you also have the right to make a complaint to the Information Commissioner's Office. Their address is: First Contact Team, Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, SK9 5AF.

What personal information we collect about you

We will collect and process the personal information that you give us by phone, e-mail, filling in forms, including on our website, and when you report a problem with our website. We also collect personal information from your appointed agent such as your trustee, broker, intermediary or financial adviser in order to provide you with the services you have requested and from other sources, such as credit reference agencies and other insurance companies, for verification purposes. We will also collect information you have volunteered to be in the public domain and other industry-wide sources. We will only collect personal information that we require to fulfil our contractual or legal requirements unless you consent to provide additional information. The type of personal information we will collect includes; basic personal information (i.e. name, address and date of birth), occupation and financial details, health and family information, claims and convictions information and where you have requested other individuals be included in the arrangement, personal information about those individuals.

If you give us personal information on other individuals, this will be used to provide you with a quotation and/or contract of insurance and/or provision of financial services. You agree you have their permission to do so. Except where you are managing the contract on another's behalf, please ensure that the individual knows how their personal information will be used by Zurich. More information about this can be found in the 'How we use your personal information' section.

How we use your personal information

We and our selected third parties will only collect and use your personal information (i) where the processing is necessary in connection with providing you with a quotation and/or contract of insurance and/or provision of financial services that you have requested; (ii) to meet our legal or regulatory obligations; or (iii) for our 'legitimate interests'. It is in our legitimate interests to collect your personal information as it provides us with the information that we need to provide our services to you more effectively



including providing you with information about our products and services. We will always ensure that we keep the amount of information collected and the extent of any processing to the absolute minimum to meet this legitimate interest. Examples of the purposes for which we will collect and use your personal information are:

1. to provide you with a quotation and/or contract of insurance;
2. to identify you when you contact us;
3. to deal with administration and assess claims;
4. to make and receive payments;
5. to obtain feedback on the service we provide to you;
6. to administer our site and for internal operations including troubleshooting, data analysis, testing, research, statistical and survey purposes;
7. for fraud prevention and detection purposes.

We will contact you to obtain consent prior to processing your personal information for any other purpose, including for the purposes of targeted marketing unless we already have consent to do so.

Who we share your personal information with

Where necessary, we will share the personal information you gave us for the purposes of providing you with the goods and services you requested with the types of organisations described below:

associated companies including reinsurers, suppliers and service providers;
introducers and professional advisers;
regulatory and legal bodies;
survey and research organisations;
credit reference agencies;
healthcare professionals, social and welfare organisations; and
other insurance companies

Or, in order to meet our legal or regulatory requirements, with the types of organisations described below:

regulatory and legal bodies;
central government or local councils;
law enforcement bodies, including investigators;
credit reference agencies; and
other insurance companies

How we use your personal information for websites and email communications

When you visit one of our websites we may collect information from you such as your email address or IP address. This helps us to track unique visits and monitor patterns of customer website traffic, such as who visits and why they visit.

We use cookies and/or pixel tags on some pages of our website. A cookie is a small text file sent to your computer. A pixel tag is an invisible tag placed on certain pages of our website but not on your computer. Pixel tags usually work together with cookies to assist us to provide you with a more tailored service. This allows us to monitor and improve our email communications and website. Useful information about cookies, including how to remove them, can be found on our websites.

How we transfer your personal information to other countries

Where we transfer your personal information to countries that are outside of the UK and the European Union (EU) we will ensure that it is protected and that the transfer is lawful. We will do this by ensuring that the personal information is given adequate safeguards by using 'standard contractual clauses' which have been adopted or approved by the UK and the EU, or other solutions that are in line with the requirements of European data protection laws.

A copy of our security measures for personal information transfers can be obtained from our Data Protection Officer at: Zurich Insurance Group, Tri-centre 1, Newbridge Square, Swindon, SN1 1HN, or by emailing the Data Protection Officer at GBZ.General.Data.Protection@uk.zurich.com.

How long we keep your personal information for

We will retain and process your personal information for as long as necessary to meet the purposes for which it was originally collected. These periods of time are subject to legal, tax and regulatory requirements or to enable us to manage our business.

Your data protection rights

You have a number of rights under the data protection laws, namely:

- to access your data (by way of a subject access request);
 - to have your data rectified if it is inaccurate or incomplete;
 - in certain circumstances, to have your data deleted or removed;
 - in certain circumstances, to restrict the processing of your data;
 - a right of data portability, namely to obtain and reuse your data for your own purposes across different services;
 - to object to direct marketing;
 - not to be subject to automated decision making (including profiling), where it produces a legal effect or a similarly significant effect on you;
 - to claim compensation for damages caused by a breach of the data protection legislation.
- if we are processing your personal information with your consent, you have the right to withdraw your consent at any time.

We will, for the purposes of providing you with a contract of insurance, processing claims, reinsurance and targeted marketing, process your personal information by means of automated decision making and profiling where we have a legitimate interest or you have consented to this.

What happens if you fail to provide your personal information to us

If you do not provide us with your personal information, we will not be able to provide you with a contract or assess future claims for the service you have requested.

Fraud prevention and detection

In order to prevent and detect fraud we may at any time:

- check your personal data against counter fraud systems
- use your information to search against various publicly available and third party resources
- use industry fraud tools including undertaking credit searches and to review your claims history
- share information about you with other organisations including but not limited to the police, the Insurance Fraud Bureau (IFB), other insurers and other interested parties.

If you provide false or inaccurate information and fraud is identified, the matter will be investigated and appropriate action taken. This may result in your case being referred to the Insurance Fraud Enforcement Department (IFED) or other police forces and fraud prevention agencies. You may face fines or criminal prosecution. In addition, Zurich may register your name on the Insurance Fraud Register, an industry-wide fraud database.

Claims history

We may pass information relating to claims or potential claims to any relevant database. We and other insurers may search these databases when you apply for insurance, when claims or potential claims are notified to us or at time of renewal to validate your claims history or that of any other person or property likely to be involved in the policy or claim.

This helps to check information provided and prevent fraudulent claims.



Appendix C – Historic Maps



enviro | solution

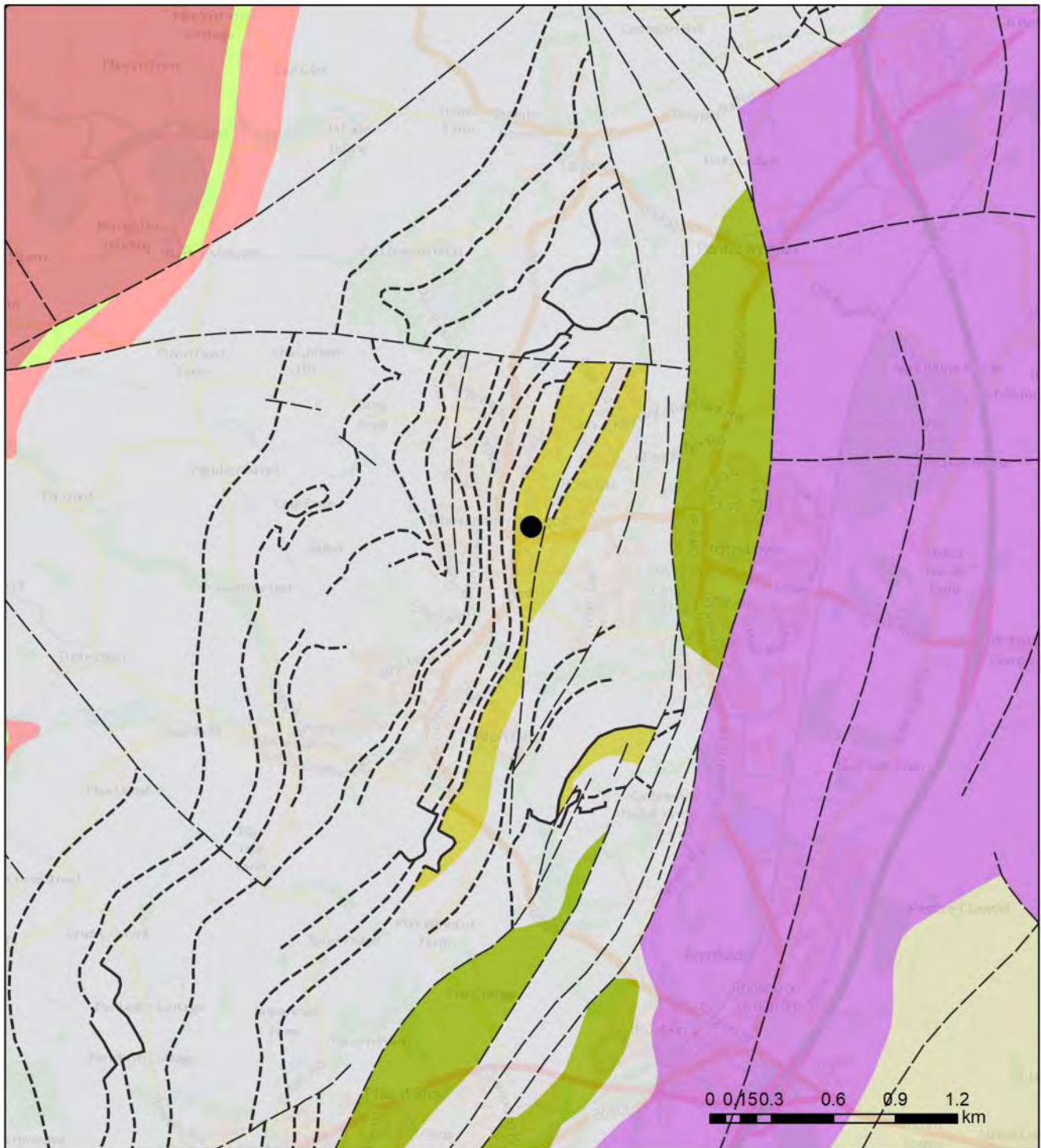
Date: 1872
Scale 1:10,560





Appendix D – Geological Maps

Bedrock Geology



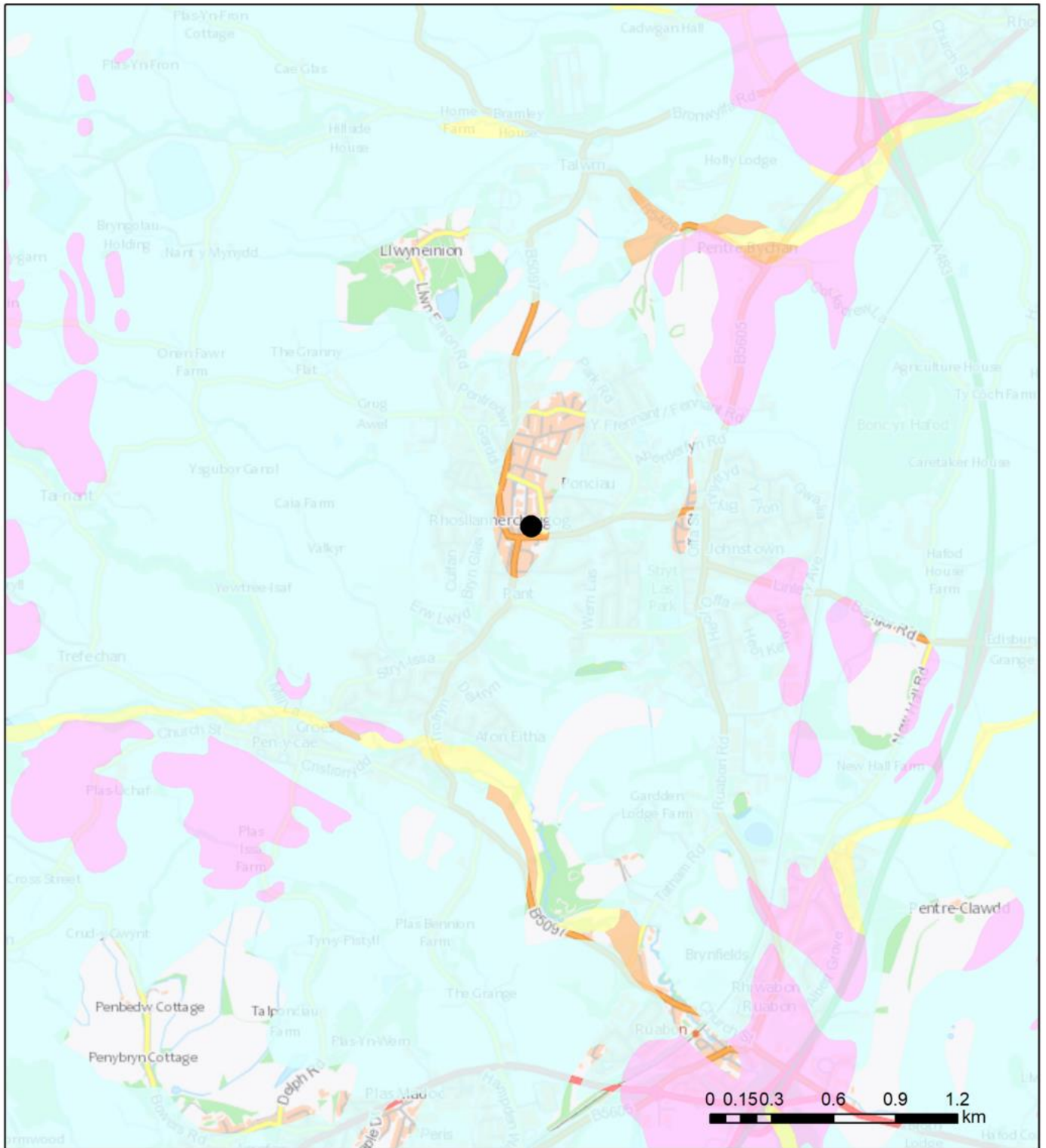
Bedrock geology 1:50,000 scale

- PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE
- ETRURIA FORMATION - MUDSTONE
- MINERA FORMATION - LIMESTONE AND (SUBEQUAL/SUBORDINATE) SANDSTONE, INTERBEDDED
- HALESOWEN FORMATION - MUDSTONE, SILTSTONE AND SANDSTONE
- GWESPYR SANDSTONE - SANDSTONE AND (SUBEQUAL/SUBORDINATE) ARGILLACEOUS ROCKS, INTERBEDDED
- SALOP FORMATION - MUDSTONE, SANDSTONE AND CONGLOMERATE
- CEFN-Y-FEDW SANDSTONE FORMATION - SANDSTONE AND (SUBEQUAL/SUBORDINATE) ARGILLACEOUS ROCKS, INTERBEDDED
- BOWLAND SHALE FORMATION - MUDSTONE
- PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - SANDSTONE
- CEFN-Y-FEDW SANDSTONE FORMATION - CHERT
- CEFN ROCK - SANDSTONE

Linear features 1:50,000 scale

- Coal_seam_Inf
- Coal_seam_Obs
- ↔ Mineral_Vein_Inf

Superficial Geology



Superficial deposits 1:50,000 scale

GLACIOFLUVIAL DEPOSITS, DEVENSIAN - SAND AND GRAVEL

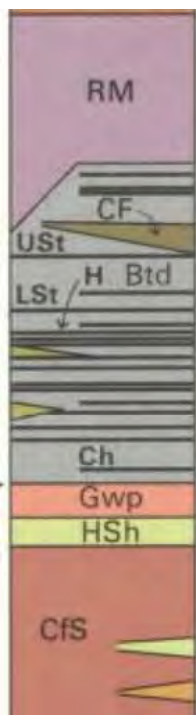
TILL, DEVENSIAN - DIAMICTON

ALLUVIUM - CLAY, SILT, SAND AND GRAVEL

RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - SAND AND GRAVEL

PEAT - PEAT

BGS Geological Survey 1:50,000 Series England and Wales Sheet 121 Wrexham



RUABON MARL FORMATION
(240-330)

>BY
Cefn Rock

BETTISFIELD Fm
(400-520)
(Productive Coal Measures)

S = sandstone

GWESPYR SANDSTONE (25)
HOLYWELL SHALES (45-25)

CEFN-Y-FEDW SANDSTONE
(250-150)
mudstones
cherty beds

COAL SEAM NAMES

Mo	MORLAS
BY	BERSHAM YARD GROUP (from ALPHA (a) or ALPHA RYDER (aR) to DELTA (Δ) or DELTA BENCH (ΔB))
USt	UPPER STINKING
W	WARRAS
LSt	LOWER STINKING
Po	POWELL
H	HOLLIN
C	CRANK
Q	QUAKER
M	MAIN
Cr	CROWN
UR	UPPER RED
LR	LOWER RED
FG	FIRECLAY GROUP
N	NANT
RY	RUABON YARD
P	PREMIER
LLy	LLWYNEINION HALF-YARD
Ch	CHWARELAU

Appendix E – BGS Borehole Logs

SJ24NE44/A

SOUTH LANCS. BORING CO. (U.K.) LTD.

CHAPEL STREET · PEMBERTON · WIGAN

Telephone — Wigan 83237/8

BOREHOLE RECORD SHEET

Job No. 1972

Date 17. 4. 73

Location YSGOLY WERN RHOSLLANERCHRUGOG

2925 4620

Carried out for JAMES WILLIAMSON & PARTNERS

Borehole No. 1

Diameter 4"

Ground Level

Scale 1:125

DESCRIPTION	O.S.D.	LEGEND	DEPTH	THICK- NESS	SAMPLE	S.P.T. "N" VALUE	WATER LEVELS
MADE GROUND (TARMACADAM)			0.1				
Loose grey mudstone fragments.			1.8	1.7			
Firm grey mudstone fragments.			2.3	0.5			
Light brown silty CLAY			2.8	0.5			
Firm yellow silty CLAY.			3.7	0.9			
Firm yellowish brown weathered MUDSTONE				3.0			
Hard grey MUDSTONE			6.7	0.9			
Hard grey SILTSTONE			7.6	0.6			
Hard grey brown MUDSTONE			8.2	0.5			
Hard grey siltstone with occasional thin bands of yellowish brown MUDSTONE			8.7				
				5.0			
			13.7				
Hard yellow SILTSTONE				5.5			
			19.2				
Firm black SHALE				2.4			
			21.6				
Firm grey MUDSTONE				1.9			
			23.5				
							END OF BORE.

Undisturbed Sample



Disturbed Sample



Water Sample



Standard Penetration



SOUTH LANCs. BORING CO. (U.K.) LTD.

CHAPEL STREET · PEMBERTON · WIGAN

Telephone — Wigan 83237/8

BOREHOLE RECORD SHEET

Job No. 1972

Date 17.4.73

Location YSGOL Y WERN, RHOSLLANERCHRUOG

Carried out for JAMES WILLIAMSON & PARTNERS

Borehole No. 4

Diameter 4"

Ground Level

Scale 1:125

DESCRIPTION	O.S.D.	LEGEND	DEPTH	THICK- NESS	SAMPLE	S.P.T. "N" VALUE	WATER LEVELS
TOP SOIL			0.3	0.3			
Soft yellowish brown, stony silty CLAY			2.1	2.1			
Firm yellowish brown weathered MUDSTONE			2.4	0.6			
Hard light grey MUDSTONE			3.0	1.9			
Hard light grey SILTSTONE			4.9	6.7			
Hard light grey SILTSTONE with occasional thin bands of firm brown mudstone.			11.6	7.3			
Soft mudstone and siltstone (BROKEN GROUND)			18.9	0.6			
Hard light grey SILTSTONE			19.5	0.3			
Coal fragments (OLD WORKINGS)			19.8	0.6			
Firm black shale.			20.4	2.0			
Firm grey MUDSTONE			22.4	3.2			
Firm black SHALE with occasional thin bands of coal. (OLD WORKINGS?)			25.6	1.8			
			27.4				END OF BORE

Undisturbed Sample



Disturbed Sample



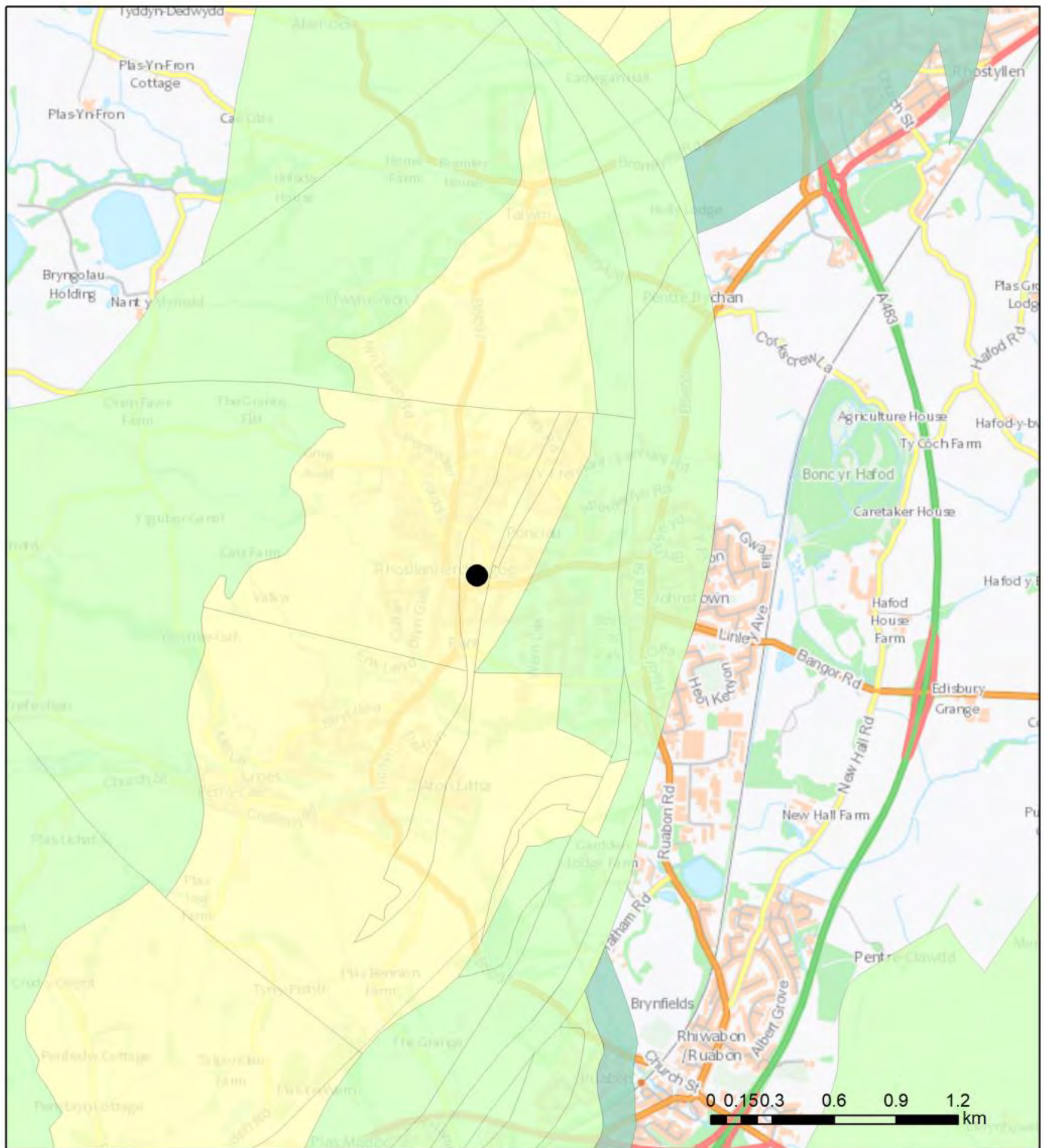
Water Sample



Standard Penetration



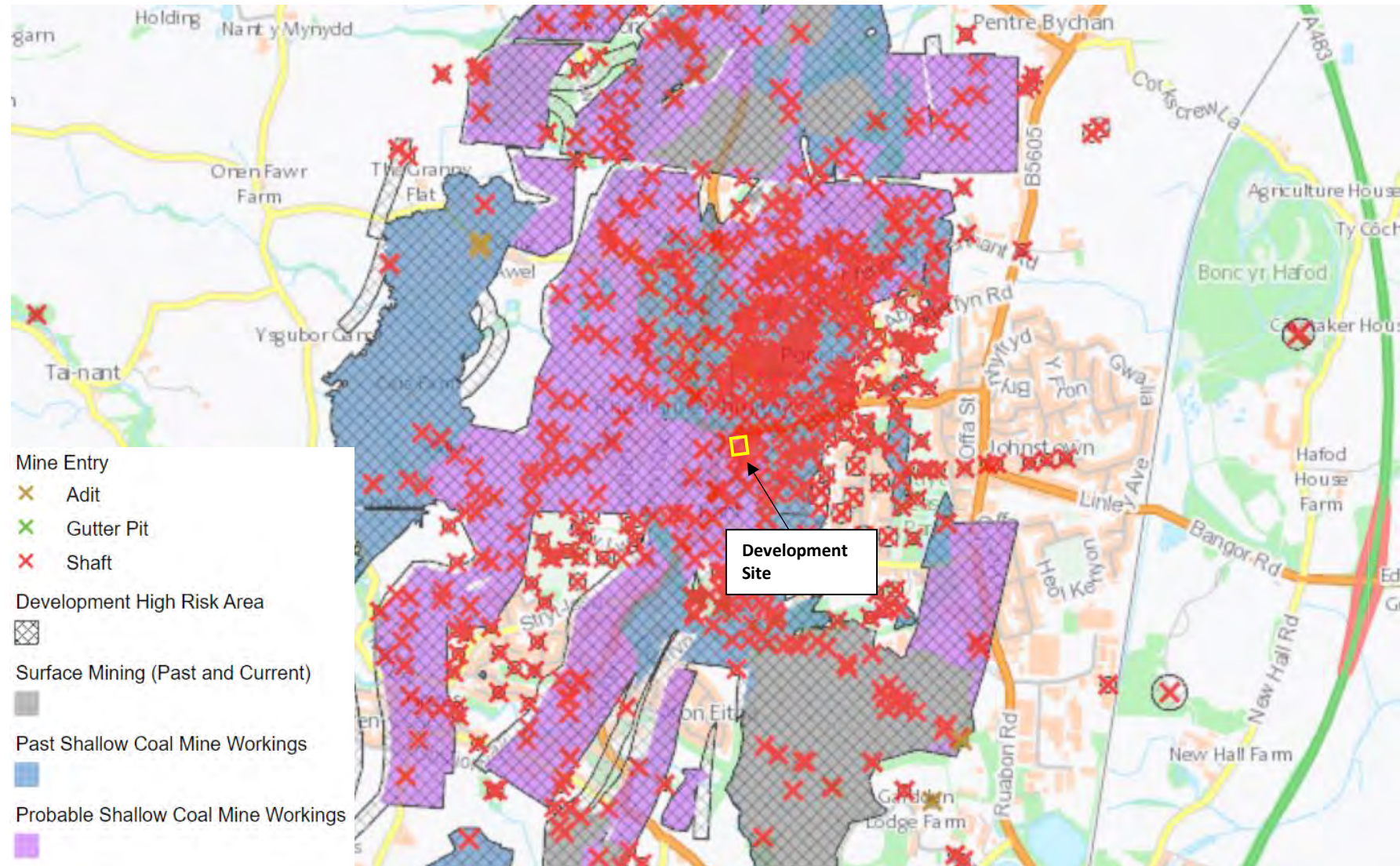
Appendix F – Coal Resource Map



Shallow Coal

- Buried coal resource overlain by up to 50m overburden
- Primary opencast coal resource area
- Secondary opencast coal resource area
- Tertiary opencast coal resource area

Appendix G – Coal Mining Summary Map



Received 20.2.2013 P/2012/0010

Wern School Rhosllanerchrugog

Geotechnical Report

Heed Developments Ltd



GroundSolve Ltd

Consulting Geotechnical, Engineering Geology and Environmental Engineers

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2. Existing Site Layout
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5. Exploratory Hole Locations and Ground Constraints
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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 Lancs 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

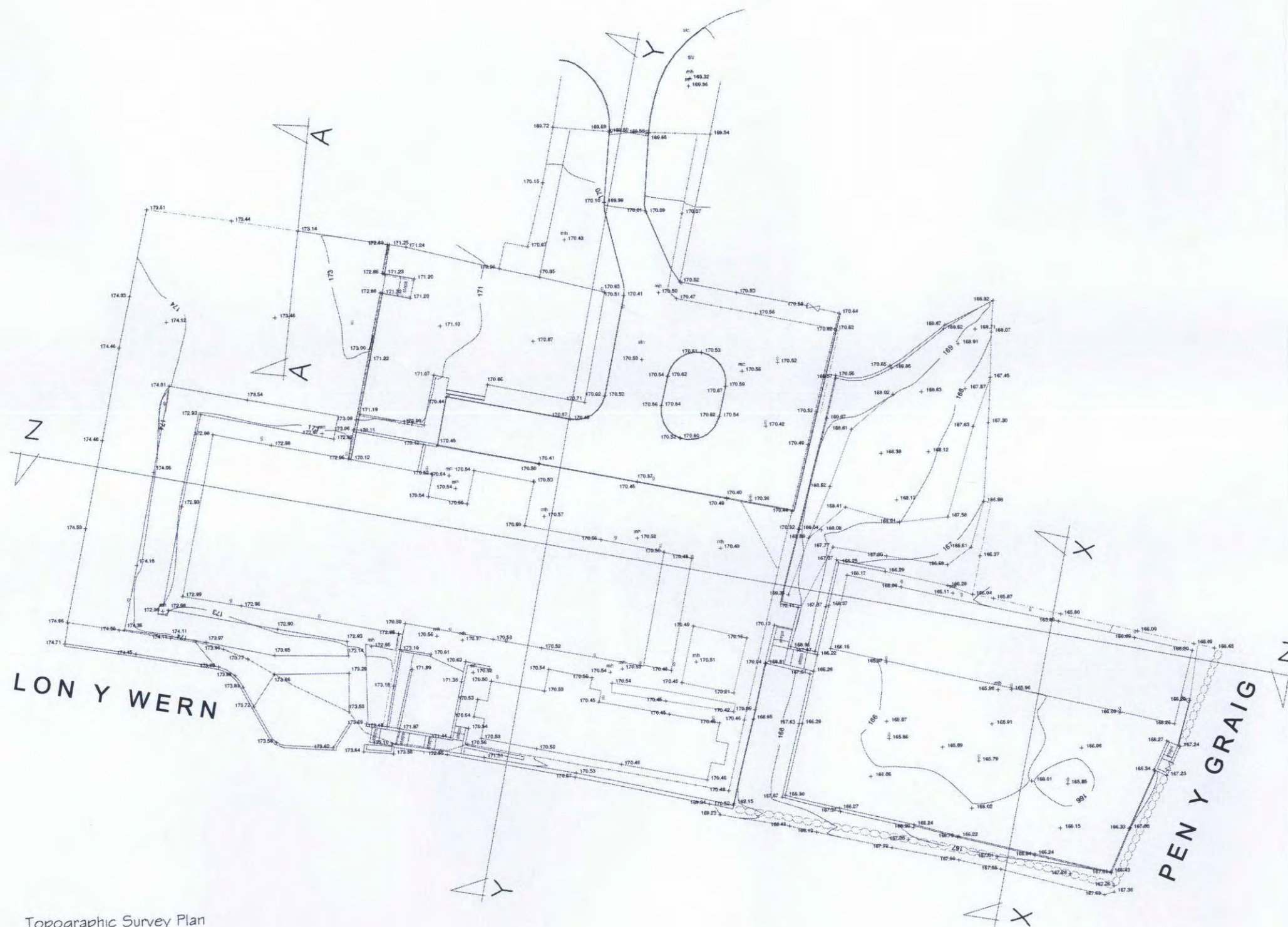
LICENSE No. 100030802

SITE LOCATION

FIGURE **1**



HILL STREET

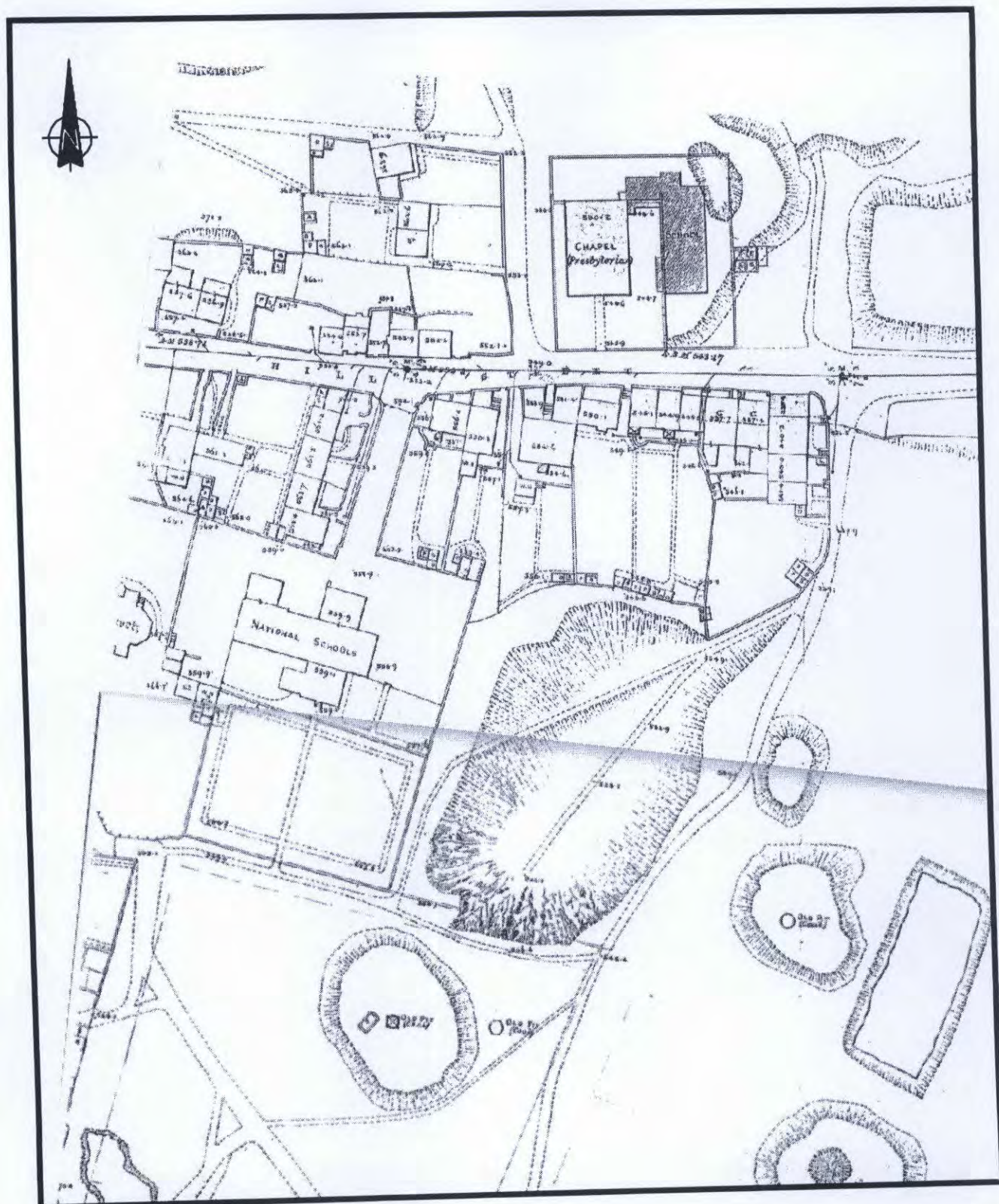


Topographic Survey Plan

SCALE 1:500

**EXISTING
SITE LAYOUT**

FIGURE **2**



SCALE - 1 : 2500 approx

HISTORY

FIGURE **3**



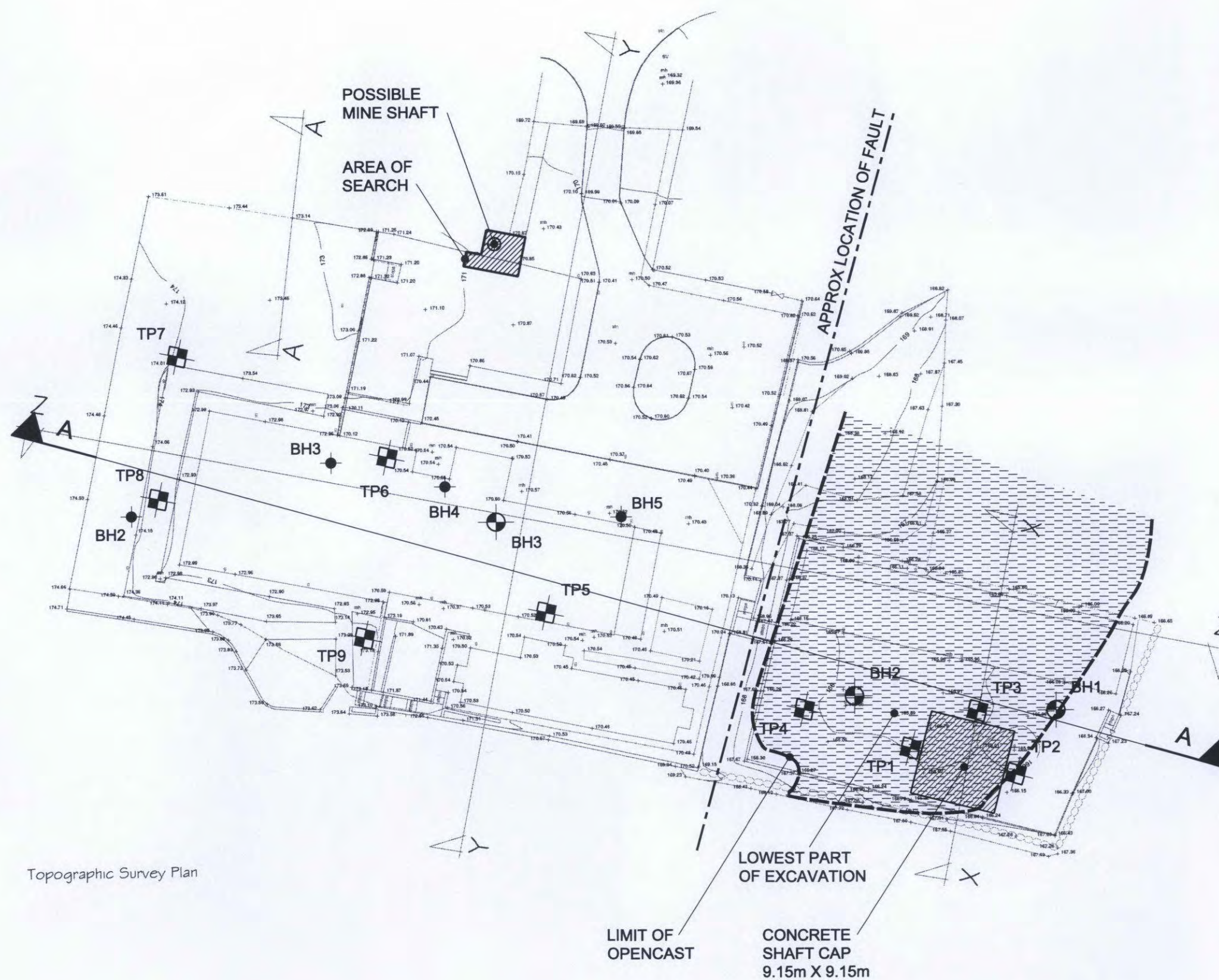
LEGEND

BH1
BOREHOLE
(previous investigation)

TP1
TRIAL PIT LOCATION
(this investigation)

BH1
BOREHOLE LOCATION
(this investigation)

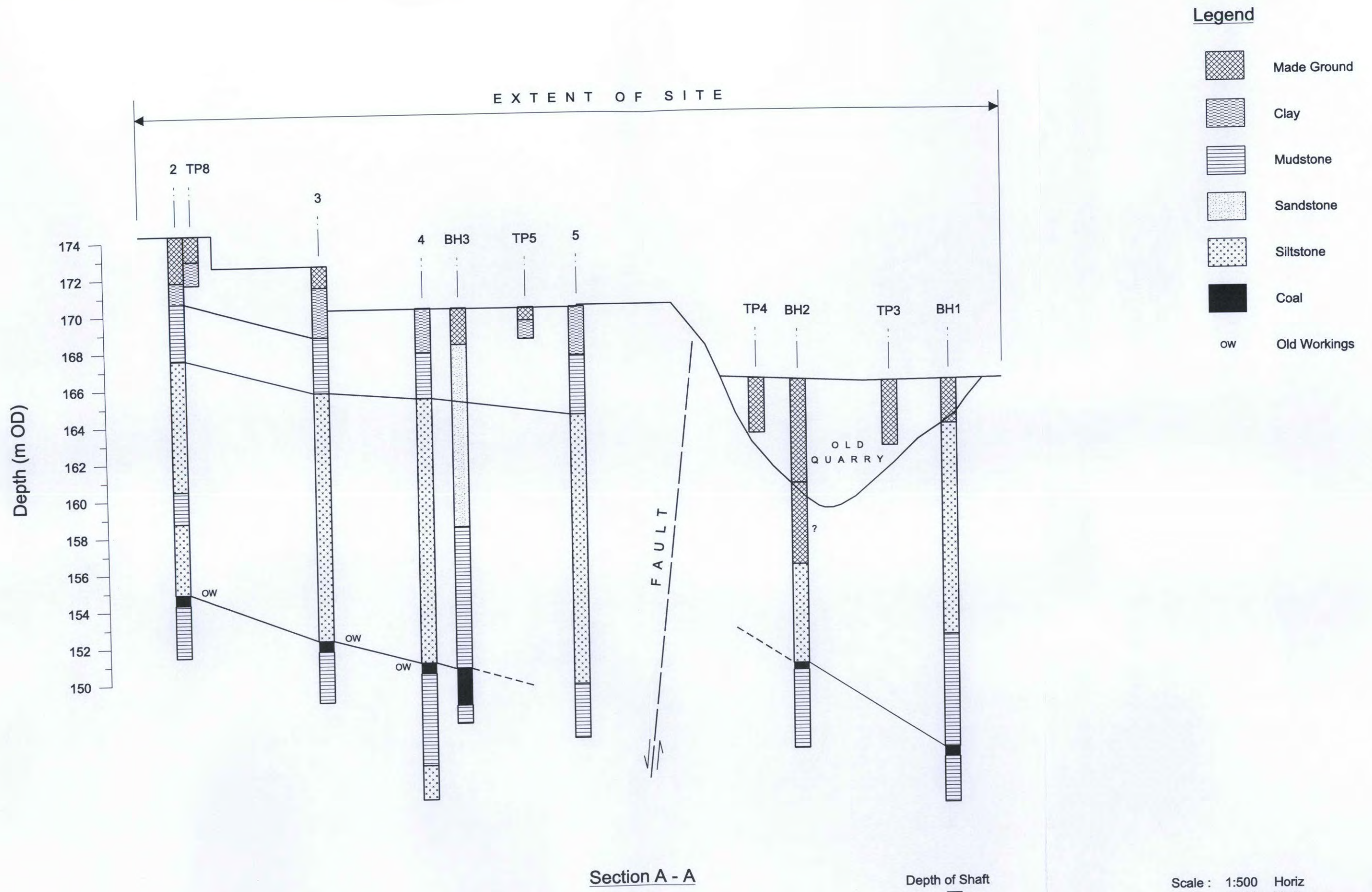
X X
SECTION A - A
(see Figure 6)



SCALE 1:500

**EXPLORATORY HOLE
LAYOUT AND GROUND
CONSTRAINTS**

FIGURE 5



**GEOLOGICAL
CROSS SECTION**

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 *IPW*

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 Denbigshire 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

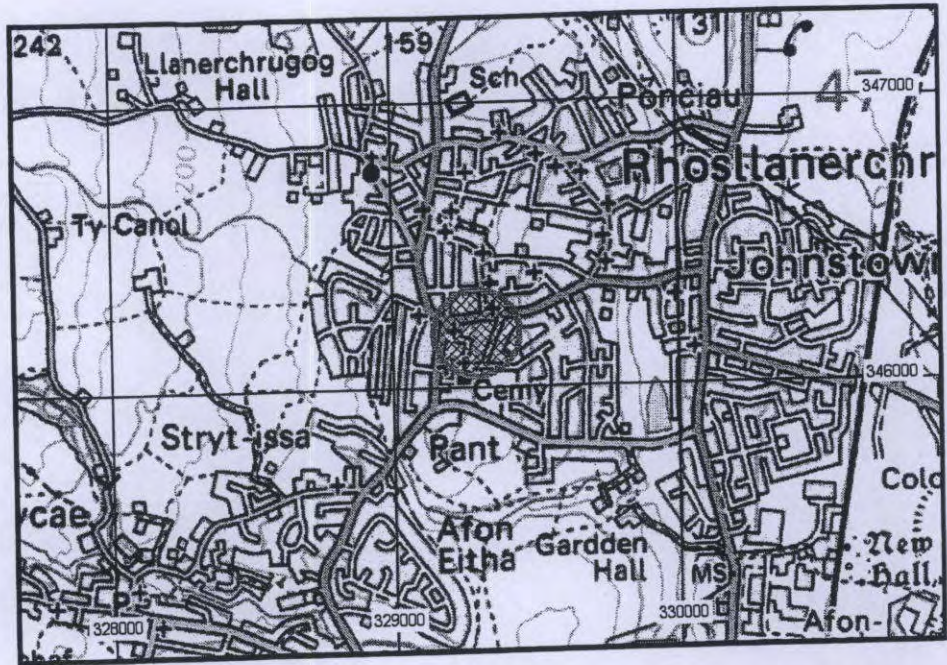
This report is prepared in accordance with the Law Society's Guidance Notes 2006, the User Guide 2006 and the Coal Authority and Cheshire Brine Board's Terms and Conditions 2006. The report is compliant with Home Information Pack requirements.

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Location map



Approximate
position
of property



Enquiry boundary

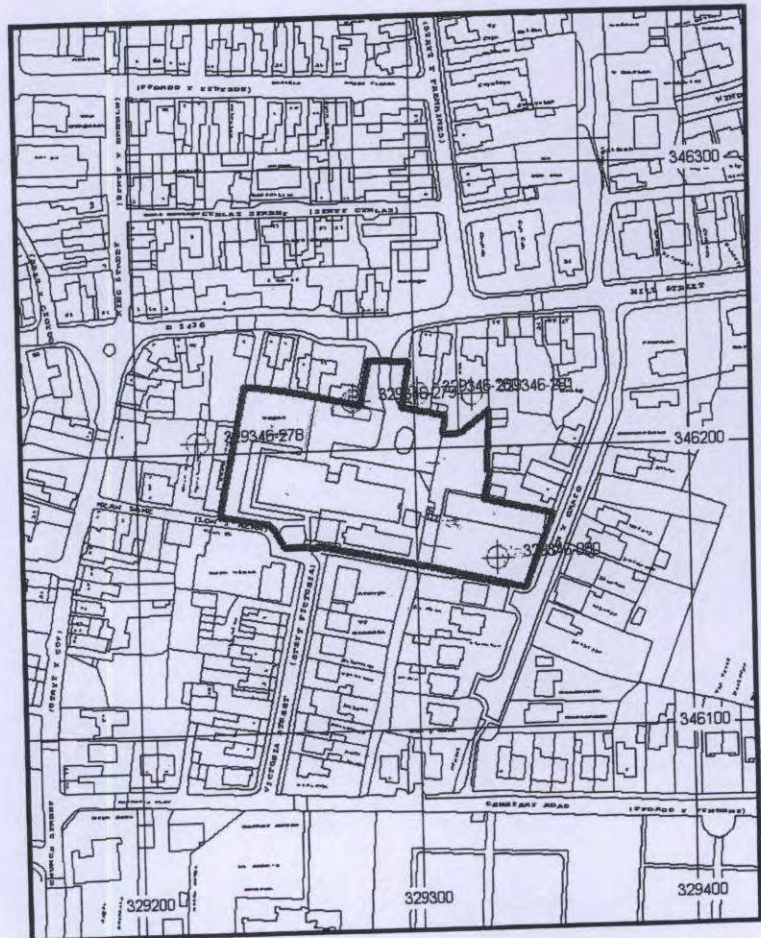
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Key

Approximate position of enquiry boundary shown



Disused Adit or Mineshaft



The COAL AUTHORITY



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

200 Lichfield Lane
Berry Hill
Mansfield
Nottinghamshire
NG18 4RG

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.

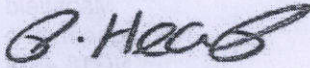
The accompanying permit certificate and supporting documentation should be copied to all interested parties, especially the site operatives, and be available for inspection on a site visit by the Authority or the HSE.

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

The
COAL
AUTHORITY

Our Ref: 7476
Your Ref:
Grounding 110
Unit 1
Well House Drive
Chester Road
Barnes
CHESTER
CH4 0DP

For the attention of Mike Cook

Dear Sir

Ysgol Y Wen, Rhos, Wrexham

Application for Permission to Enter or Disturb Coal Authority Mining Interest

I refer to your application, on behalf of your client, for permission to enter the Coal Authority's mining property. Attached is a letter as the stated conditions and supporting documentation which shows you to carry out the work in the specified area in accordance with the site plan shown on the plan which is part of the attached mining report.

You should be aware that mining may be present within the site and that there may be voids above and below the ground surface and/or within the ground. Coal Authority's mining interest may be present within the proposed work area. It is your responsibility to ensure that you are aware of the mining interest and to ensure that you are aware of the mining interest and to ensure that you are aware of the mining interest.

It may be that your client's mining interest would be affected by the mining interest and the appropriate advice should be taken. Any advice should be taken into account of the site plan and the building on land that may be affected by the mining interest and the mining interest should be taken into account of the site plan and the building on land that may be affected by the mining interest.

Care should be taken when investigating the mining interest and the appropriate advice should be taken. Any advice should be taken into account of the site plan and the building on land that may be affected by the mining interest and the mining interest should be taken into account of the site plan and the building on land that may be affected by the mining interest.

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

The permit certificate is issued on the understanding that under no circumstances will work be carried out without the approval of the Authority.

Please submit full details of all work undertaken as required by the Permitting Terms and Conditions when the work is complete. At this time you will need to confirm the Permitting Terms and Conditions when the work is complete. At this time you will need to confirm the Permitting Terms and Conditions when the work is complete.

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

THE COAL AUTHORITY

Permit Reference Number 7476

Permission to Enter or Disturb Coal Authority Mining Interests

Name and Address of Permit Holder:

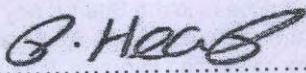
Beech Developments
24 Middle Road
Coedpoeth
WREXHAM
LL11 3TN

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 661381
 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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Ordnance Survey Licence number: 100020315



Key

Approximate position of enquiry
boundary shown

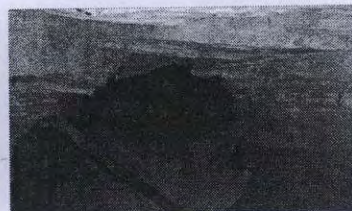
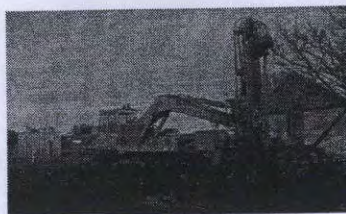


Disused Adit or Mineshaft



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
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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?			

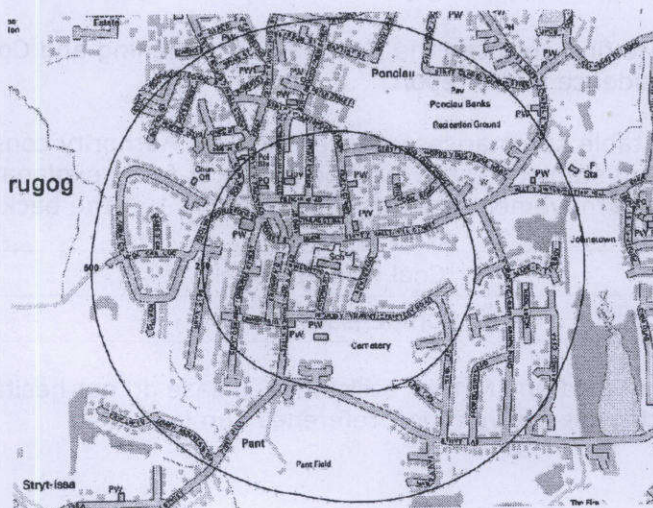
Signed.....	Date
Print Name	Position
E-mail	Tel No

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

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