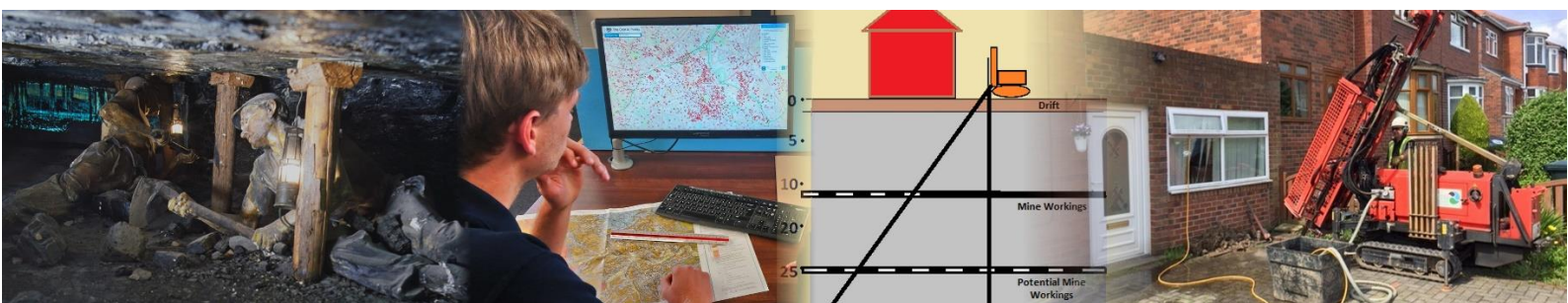




GEOLOGICAL
 GEOTECHNICAL
 GEOENVIRONMENTAL
 CONSULTANCY
 DRILLING & DATA ACQUISITION



GEOINVESTIGATE LIMITED

Coal Mining Risk Assessment (CMRA)

LOCATION	Proposed Development, 5 Dry Hill Lane, Denby Dale, Huddersfield, Kirklees HD8 8YN
ISSUE DATE	14 th October 2019
FOR	Charlotte Buckley
CLIENT REF.	
OUR REF.	G19384

Prepared by

Checked by

Matthew Walker BSc(Hons)
 Asst. Geo-environmental Engineer

Stuart Howe BSc(Hons) FGS
 Senior Geo-environmental Engineer

SUMMARY FINDINGS

OUTCOME (MITIGATION REQUIRED)

Exploratory drilling is required to investigate possible underground coal mine workings within very shallow and or shallow depth beneath this site.

WHAT TO DO NEXT

Obtain quotes for the intrusive site investigation works. The cost of the SI works should be a **"lump sum" fixed price**. Geoinvestigate can provide advice and assistance with helping you find suitable site investigation & drilling contractors. Call us on 01642 713779 or email enquiries@geoinvestigate.co.uk.

1. CMRA INTRODUCTION

1.1 SITE LOCATION AND DESCRIPTION

The approximate centre of this site is at National Grid Reference E 424035, N 408219 with an elevation of about 209m AOD. The boundary shown RED on the Coal Authority (CA) report provided in Appendix A corresponds with the planning application area. Google Satellite and Street View imagery shows the site located in an area of arable land south of Buckley Dairy Farm. The development currently comprises terrace No. 5 with rear outbuilding. The dwelling faces onto Dry Hill Lane with front garden area comprising grass, trees and bushes. Several large agricultural structures/sheds are present to the rear and west of the property. A vacant barn/terrace is adjacent to the west of the dwelling. The surface of the site gently falls to the southeast and raises to the northwest. Site images are presented in Appendix B.

The OS map record dating back to 1851 shows the property similarly located within 'Dry Hill' farm/settlement. A sandstone quarry is shown some 250m northwest of the development on 'Quarry Hill' at this date. More quarries are recorded in the distant surrounding area. A pump is shown within the front garden area on OS map from 1893. The historical OS map record provides no evidence that the site itself has been subject to sand, clay or gravel pitting or stone quarrying activity though several quarries are recorded in the surrounding area.

Description & Layout of Proposed Development: It is proposed to demolish the attached outbuilding and erect a single storey front extension and two storey rear extension. The proposed development plan is included in Appendix C.

Risk Methodology Applied: This document and the risk assessment methodology adopted herein is based on CA publication RISK BASED APPROACH TO DEVELOPMENT MANAGEMENT - GUIDANCE FOR DEVELOPERS Version 3, 2014 and Version 4 - 2017. The template contained therein is adopted with amendments made by Geoinvestigate Limited.

2. ASSESSMENT OF SITE-SPECIFIC COAL MINING ISSUES

The table below summarises the potential risks associated with coal mining legacy for the proposed development site identified from the CA report in Appendix A:

Coal Mining Issues	Yes	No	Risk Assessment/Remarks
Past underground coal mining		No	
Probable unrecorded shallow workings	Yes		2.1.1 (refer below)
Spine roadways at shallow depth		No	
Mine entries		No	
Outcrop		No	2.1.2
Geological faults, fissures and breaklines		No	
Opencast Mines		No	
Site Investigation		No	
Coal Mining Subsidence		No	
Mine Gas		No	

Note: For those coal mining issues above identified as "Yes" or highlighted "YELLOW" a more detailed discussion and assessment are made of the risks to the application site and the proposed development. Additional coal mining issues have also been discussed where appropriate.

2.1 DETAILED DISCUSSION & ASSESSMENT RESPONSE

2.1.1 Probable unrecorded shallow workings

According to the CA the site falls within an area of probable shallow unrecorded workings. The CA define Probable Unrecorded Shallow Workings as “Areas where the Coal Authority believes there to be unrecorded coal working that exist at or close to the surface” (i.e. less than 30m). It is our opinion that the probable presence of unrecorded shallow mine workings beneath the site could pose a significant surface ground stability risk to this development and therefore requires further investigation.

2.1.2 Coal Outcrop

The location of the site is shown on the extract of BGS geology map included in Appendix D. The tentative elevation of the site relative to the vertical geology column is shown below the map. According to the BGS geology map the site is underlain by the Pennine Lower Coal Measures Formation comprising interbedded grey mudstone, siltstone, pale grey sandstone and commonly coal seams.

According to the BGS geology map coal outcrop of perhaps the Black Band (Shertcliffe) Coal (?BD) is present some 275m northwest of the site. The strata beneath the site and in the surrounding is expected to dip 5° to 8° or perhaps less. Therefore, that the Black Band (Shertcliffe) Coal (?BD) is anticipated to underlie the site at perhaps shallow or very shallow depth.

The geology column suggests that the Whinmoor (Cumberworth Thick) Coal (W) underlies the Black Band Coal (BD) seam by some 12m and the Cumberworth Thin Coal (C) by a further 12m. Therefore, the site may be underlain by perhaps two further levels of coal and any working in the Whinmoor Coal (W) at shallow depth and the Cumberworth Thin Coal (C) at shallow to moderate depth.

BGS borehole log SE20NW/10 in Appendix E sunk some 35m downslope of the proposed development confirms the presence of a 0.2m thick coal seam at 4.6m depth at this location, speculatively named the Black Band Coal (BD). Provided the difference in elevation of some 4m the BD coal seam is expected to underlie the development at perhaps 9m depth. Borehole log SE20NW/10 also records 2.2m of ‘broken’ sandstone at 21.6m depth perhaps indicative of mine workings in the Whinmoor Coal (W) seam.

In our opinion, possible workings in the Black Band Coal (BD) may potentially have adequate competent rock cover (using 10x seam thickness rule) and may not pose a significant risk to the surface ground stability to the site area. However, possible working in the Whinmoor Coal (W) at shallow depth and Cumberworth Thin Coal (C) at shallow to moderate depth may pose a significant risk to the surface ground stability of the new development. Therefore, further intrusive investigation will be required to establish the presence, depth and nature of mine working (if any) beneath the new development.

2.1.3 Expected Drift/Bedrock Depth

The BGS drift geology map does not record any drift deposits with the site area and as such bedrock would be expected to occur at or near surface. However, according to BGS borehole log SE20NW/10 drift/bedrock depth is recorded to 2.8m. Similar drift/bedrock depth is expected within development area.

In our opinion, because of the importance of drift/bedrock depth in assessing mining related ground stability further investigation is required to accurately establish drift/bedrock depth within the development area.

3. SUMMARY AND OUTCOME

This CMRA has indicated the development may be underlain by three levels of very shallow and shallow mine working in the Black Band Coal (BD), Whinmoor Coal (W) and Cumberworth Thin Coal (C). In our opinion the possible occurrence of shallow mine workings beneath the site could pose a significant risk to surface ground stability within the development area.

Therefore, given the forgoing outcome it is our opinion that drilling is required to reliably establish drift/bedrock depth and the presence, depth and nature of mine workings (if any) beneath this site.

While the mine gas risk is expected to be LOW given the presence of possible shallow mine workings beneath the site, and the very serious nature of mine gas it is our opinion that this risk is raised to **MODERATE** to perhaps HIGH **until proven otherwise by drilling and gas monitoring**.

4. MITIGATION STRATEGY PROPOSED AND CONCLUSION

To properly determine the coal mining risk at this site it is proposed to drill 2 or 3 boreholes to target depths up to 30m (but not necessarily reaching 30m) to locate possible coal seams below the new development as well as drift and bedrock depth.

Risks for Different Drilling Scenarios					
Air flush	Mist flush	Foam flush	Water flush	Mud flush	Additional controls
HIGH	HIGH / MED'M	HIGH / MED'M	LOW	LOW	<ul style="list-style-type: none">Monitoring at rig and other open holes.Seal boreholes

A Coal Authority Permit needs to be obtained (ahead of) further intrusive exploratory drilling. Water Drill Flush to be used when drilling. Permit application must state **WATER ONLY DRILL FLUSH** for the safety of the public and drill crew.

On the basis of the CMRA work to date, we are of the opinion that the mining stability and mine gas risks posed by the strata beneath this site from coal mining legacy can be mitigated by routinely adopted measures and should not preclude the planning permission being registered.

In conclusion we see no reason why Planning Permission should not be granted in the interim and that these works form a condition on the planning approval.

Appendices:

- CA dated 8 October 2019 ref 51002179064001
- Site images
- Proposed development plan
- Extracts of BGS Geology Map, Sheet 86 – Glossop at 1:50000 scale
- BGS borehole log SE20NW/10

Other sources of information include historic Ordnance Survey maps and BGS boreholes nearby the site.

APPENDIX A
COAL AUTHORITY REPORT

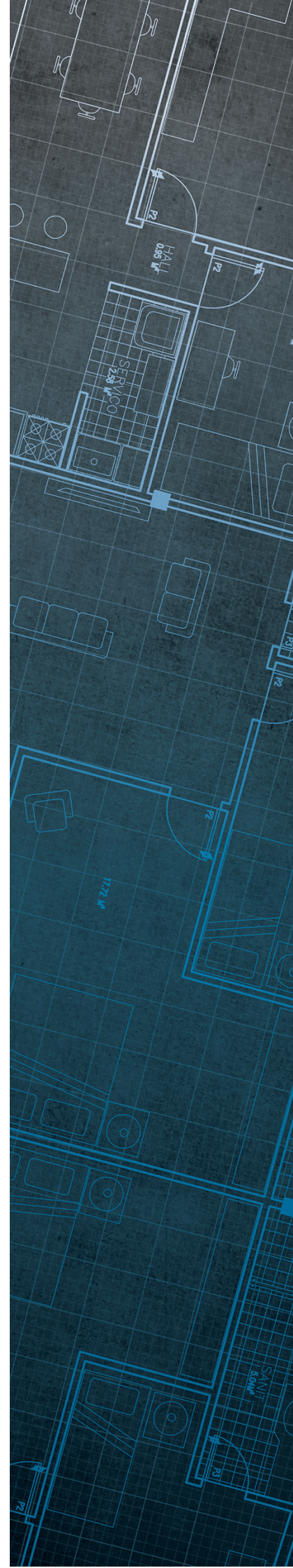


The Coal
Authority

Consultants Coal Mining Report

5 Dry Hill Lane
Denby Dale
Huddersfield
Kirklees
HD8 8YN

Date of enquiry:	8 October 2019
Date enquiry received:	8 October 2019
Issue date:	8 October 2019
Our reference:	51002179064001
Your reference:	G19384



Consultants

Coal Mining Report

This report is based on and limited to the records held by the Coal Authority at the time the report was produced.

Client name

GEOINVESTIGATE

Enquiry address

5 Dry Hill Lane
Denby Dale
Huddersfield
Kirklees
HD8 8YN

How to contact us

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

200 Lichfield Lane
Mansfield
Nottinghamshire
NG18 4RG

www.groundstability.com



 @coalauthority



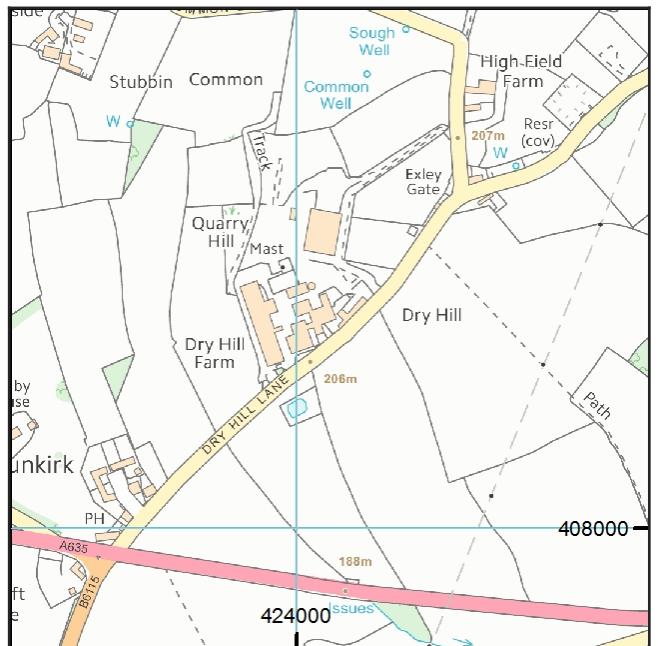
[in/company/the-coal-authority](#)



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Approximate position of property



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Section 1 – Mining activity and geology

Past underground mining

No past mining recorded.

Probable unrecorded shallow workings

Yes.

Spine roadways at shallow depth

No spine roadway recorded at shallow depth.

Mine entries

None recorded within 100 metres of the enquiry boundary.

Abandoned mine plan catalogue numbers

None available.

Outcrops

No outcrops recorded.

Geological faults, fissures and breaklines

No faults, fissures or breaklines recorded.

Opencast mines

None recorded within 500 metres of the enquiry boundary.

Coal Authority managed tips

None recorded within 500 metres of the enquiry boundary.

Section 2 – Investigative or remedial activity

Please refer to the 'Summary of findings' map (on separate sheet) for details of any activity within the area of the site boundary.

Site investigations

None recorded within 50 metres of the enquiry boundary.

Remediated sites

None recorded within 50 metres of the enquiry boundary.

Coal mining subsidence

The Coal Authority has not received a damage notice or claim for the subject property, or any property within 50 metres of the enquiry boundary, since 31 October 1994.

There is no current Stop Notice delaying the start of remedial works or repairs to the property.

The Coal Authority is not aware of any request having been made to carry out preventive works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991.

Mine gas

None recorded within 500 metres of the enquiry boundary.

Mine water treatment schemes

None recorded within 500 metres of the enquiry boundary.

Section 3 – Licensing and future mining activity

Future underground mining

None recorded.

Coal mining licensing

None recorded within 200 metres of the enquiry boundary.

Court orders

None recorded.

Section 46 notices

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

Withdrawal of support notices

The property is not in an area where a notice to withdraw support has been given.

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

Payments to owners of former copyhold land

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

Section 4 – Further information

Based on the responses in this report, no further information has been highlighted.

Section 5 – Data definitions

The datasets used in this report have limitations and assumptions within their results. For more guidance on the data and the results specific to the enquiry boundary, please **call us on 0345 762 6848** or **email us at groundstability@coal.gov.uk**.

Past underground coal mining

Details of all recorded underground mining relative to the enquiry boundary. Only past underground workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination, will be included.

Probable unrecorded shallow workings

Areas where the Coal Authority believes there to be unrecorded coal workings that exist at or close to the surface (less than 30 metres deep).

Spine roadways at shallow depth

Connecting roadways either, working to working, or, surface to working, both in-seam and cross measures that exist at or close to the surface (less than 30 metres deep), either within or within 10 metres of the enquiry boundary.

Mine entries

Details of any shaft or adit either within, or within 100 metres of the enquiry boundary including approximate location, brief treatment details where known, the mineral worked from the mine entry and conveyance details where the mine entry has previously been sold by the Authority or its predecessors British Coal or the National Coal Board.

Abandoned mine plan catalogue numbers

Plan numbers extracted from the abandoned mines catalogue containing details of coal and other mineral abandonment plans deposited via the Mines Inspectorate in accordance with the Coal Mines Regulation Act and Metalliferous Mines Regulation Act 1872. A maximum of 9 plan extents that intersect with the enquiry boundary will be included. This does not infer that the workings and/or mine entries shown on the abandonment plan will be relevant to the site/property boundary.

Outcrops

Details of seam outcrops will be included where the enquiry boundary intersects with a conjectured or actual seam outcrop location (derived by either the British Geological Survey or the Coal Authority) or intersects with a defined 50 metres buffer on the coal (dip) side of the outcrop. An indication of whether the Coal Authority believes the seam to be of sufficient thickness and/or quality to have been worked will also be included.

Geological faults, fissures and breaklines

Geological disturbances or fractures in the bedrock. Surface fault lines (British Geological Survey derived data) and fissures and breaklines (Coal Authority derived data) intersecting with the enquiry boundary will be included. In some circumstances faults, fissures or breaklines have been known to contribute to surface subsidence damage as a consequence of underground coal mining.

Opencast mines

Opencast coal sites from which coal has been removed in the past by opencast (surface) methods and where the enquiry boundary is within 500 metres of either the licence area, site boundary, excavation area (high wall) or coaling area.

Coal Authority managed tips

Locations of disused colliery tip sites owned and managed by the Coal Authority, located within 500 metres of the enquiry boundary.

Site investigations

Details of site investigations within 50 metres of the enquiry boundary where the Coal Authority has received information relating to coal mining risk investigation and/or remediation by third parties.

Remediated sites

Sites where the Coal Authority has undertaken remedial works either within or within 50 metres of the enquiry boundary following report of a hazard relating to coal mining under the Coal Authority's Emergency Surface Hazard Call Out procedures.

Coal mining subsidence

Details of alleged coal mining subsidence claims made since 31 October 1994 either within or within 50 metres of the enquiry boundary. Where the claim relates to the enquiry boundary confirmation of whether the claim was accepted, rejected or whether liability is still being determined will be given. Where the claim has been discharged, whether this was by repair, payment of compensation or a combination of both, the value of the claim, where known, will also be given.

Details of any current 'Stop Notice' deferring remedial works or repairs affecting the property/site, and if so the date of the notice.

Details of any request made to execute preventative works before coal is worked under section 33 of the Coal Mining Subsidence Act 1991. If yes, whether any person withheld consent or failed to comply with any request to execute preventative works.

Mine gas

Reports of alleged mine gas emissions received by the Coal Authority, either within or within 500 metres of the enquiry boundary that subsequently required investigation and action by the Coal Authority to mitigate the effects of the mine gas emission.

Mine water treatment schemes

Locations where the Coal Authority has constructed or operates assets that remove pollutants from mine water prior to the treated mine water being discharged into the receiving water body.

These schemes are part of the UK's strategy to meet the requirements of the Water Framework Directive. Schemes fall into 2 basic categories: Remedial – mitigating the impact of existing pollution or Preventative – preventing a future pollution incident.

Mine water treatment schemes generally consist of one or more primary settlement lagoons and one or more reed beds for secondary treatment. A small number are more specialised process treatment plants.

Future underground mining

Details of all planned underground mining relative to the enquiry boundary. Only those future workings where the enquiry boundary is within 0.7 times the depth of the workings (zone of likely physical influence) allowing for seam inclination will be included.

Coal mining licensing

Details of all licenses issued by the Coal Authority either within or within 200 metres of the enquiry boundary in relation to the under taking of surface coal mining, underground coal mining or underground coal gasification.

Court orders

Orders in respect of the working of coal under the Mines (Working Facilities and Support) Acts of 1923 and 1966 or any statutory modification or amendment thereof.

Section 46 notices

Notice of proposals relating to underground coal mining operations that have been given under section 46 of the Coal Mining Subsidence Act 1991.

Withdrawal of support notices

Published notices of entitlement to withdraw support and the date of the notice. Details of any revocation notice withdrawing the entitlement to withdraw support given under Section 41 of the Coal Industry Act 1994.

Payment to owners of former copyhold land

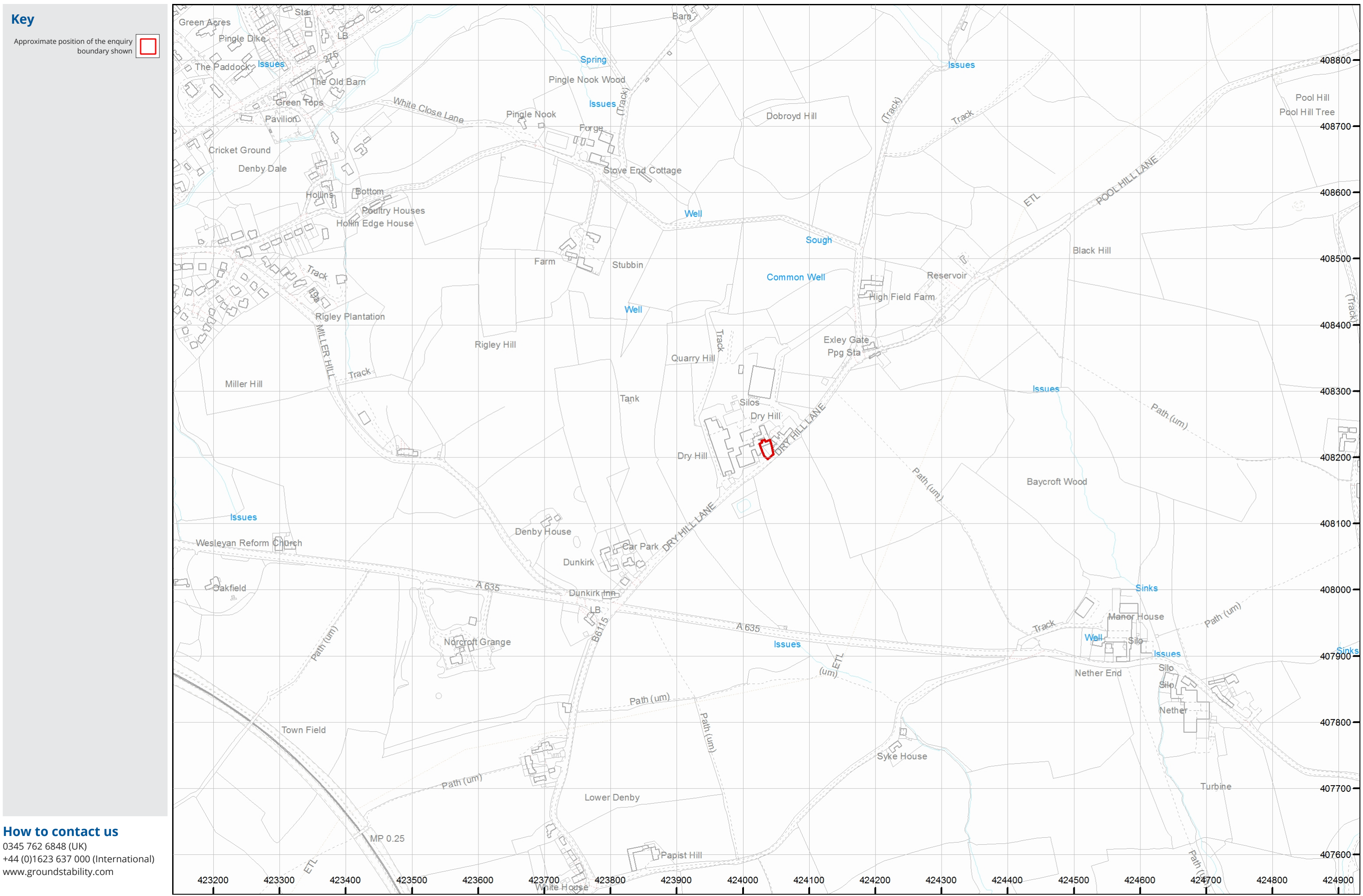
Relevant notices which may affect the property and any subsequent notice of retained interests in coal and coal mines, acceptance or rejection notices and whether any compensation has been paid to a claimant.

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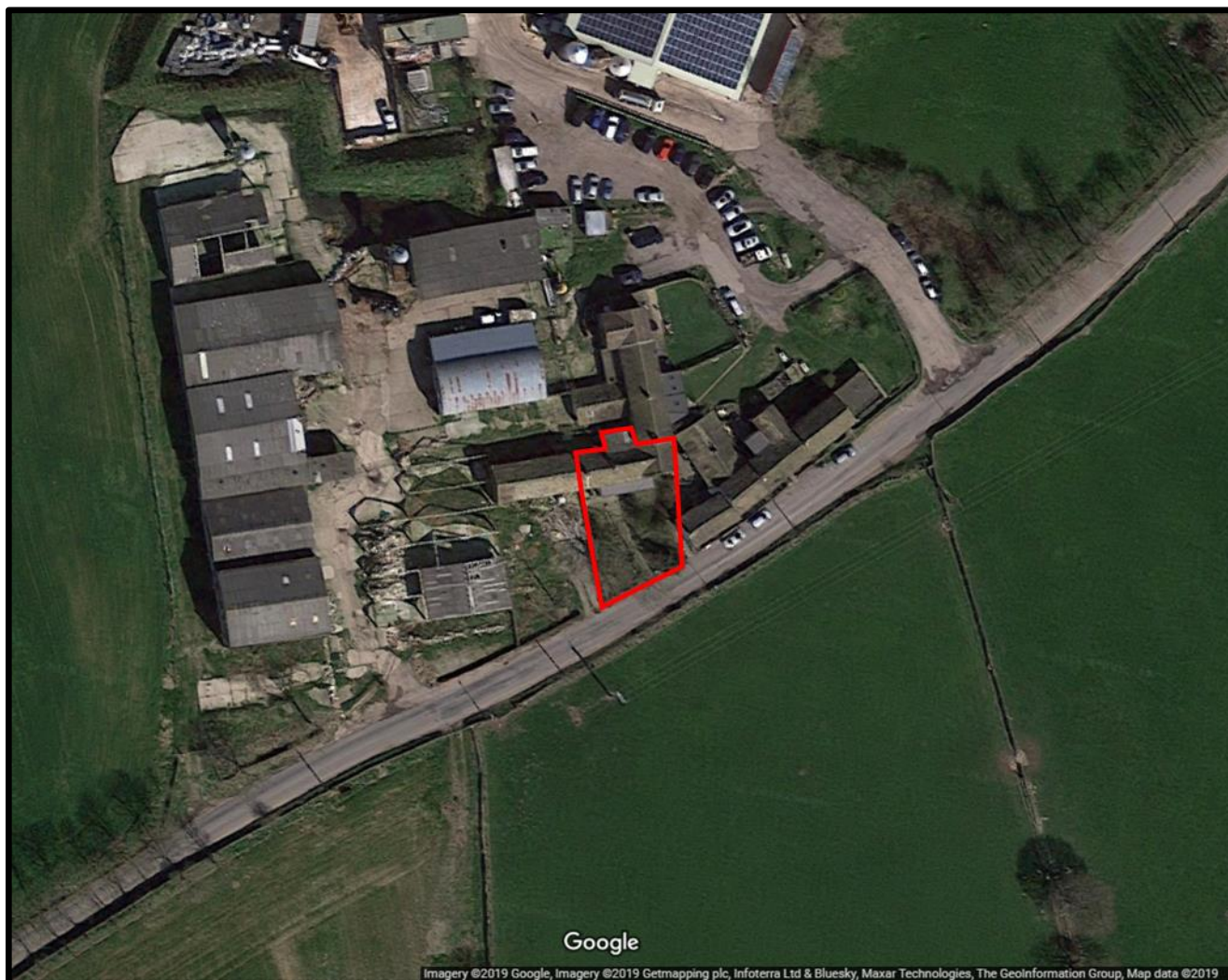
VAT receipt

Issued by	The Coal Authority 200 Lichfield Lane Mansfield Nottinghamshire NG18 4RG
Tax point date	08 October 2019
Issued to	GEOINVESTIGATE TERRY DICKEN INDUSTRIAL ESTATE TERRY DICKEN INDUSTRIAL ESTATE, ELLERBECK WAY STOKESLEY NORTH YORKSHIRE TS9 7AE
Property search for	5 DRY HILL LANE DENBY DALE HUDDERSFIELD KIRKLEES HD8 8YN
Reference number	51002179064001
Date of issue	08 October 2019
Cost	£112.13
VAT @ 20%	£22.43
Total received	£134.56
VAT registration	598 5850 68

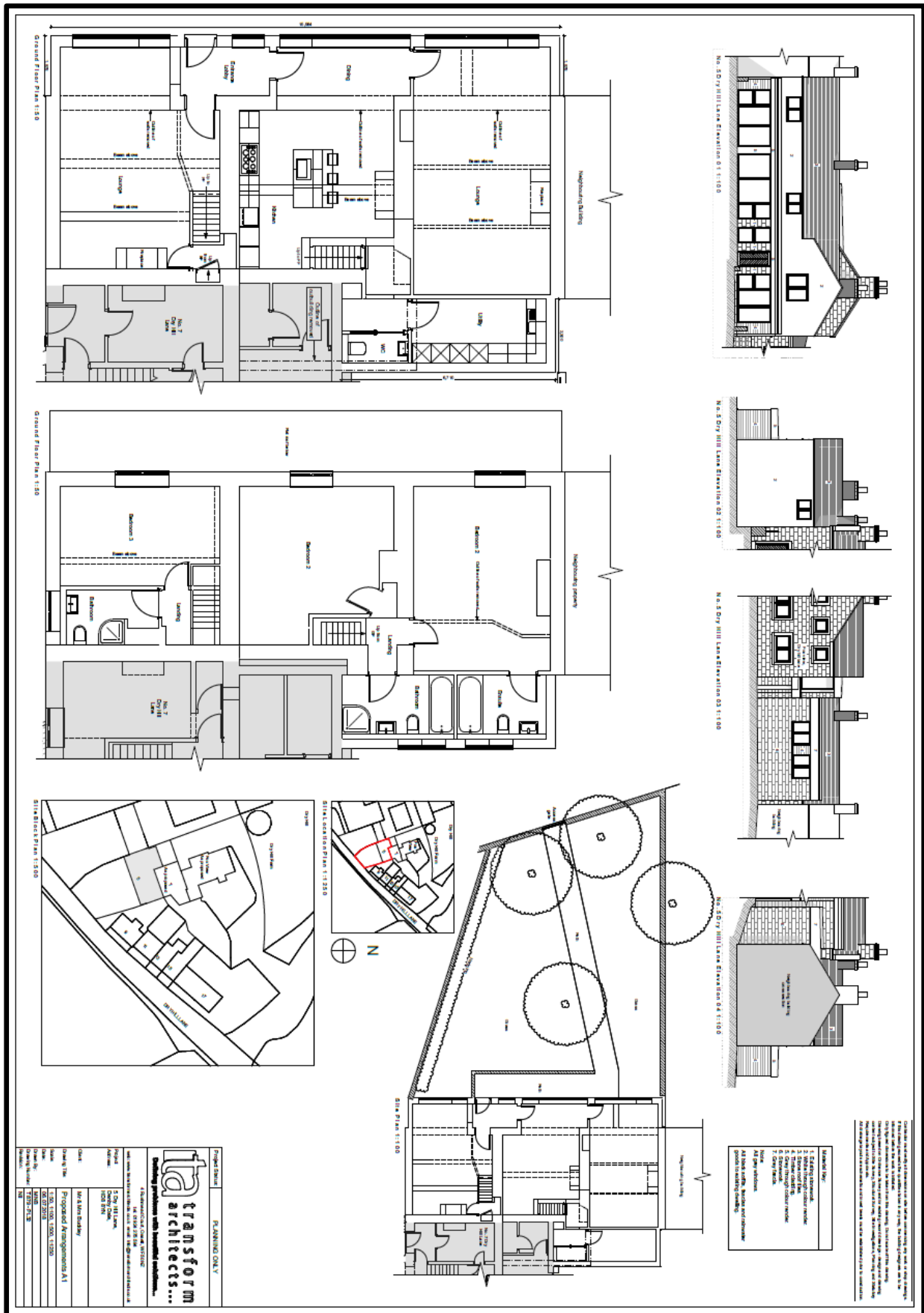
The map highlights any specific surface or subsurface features within or near to the boundary of the site.



APPENDIX B SITE IMAGES

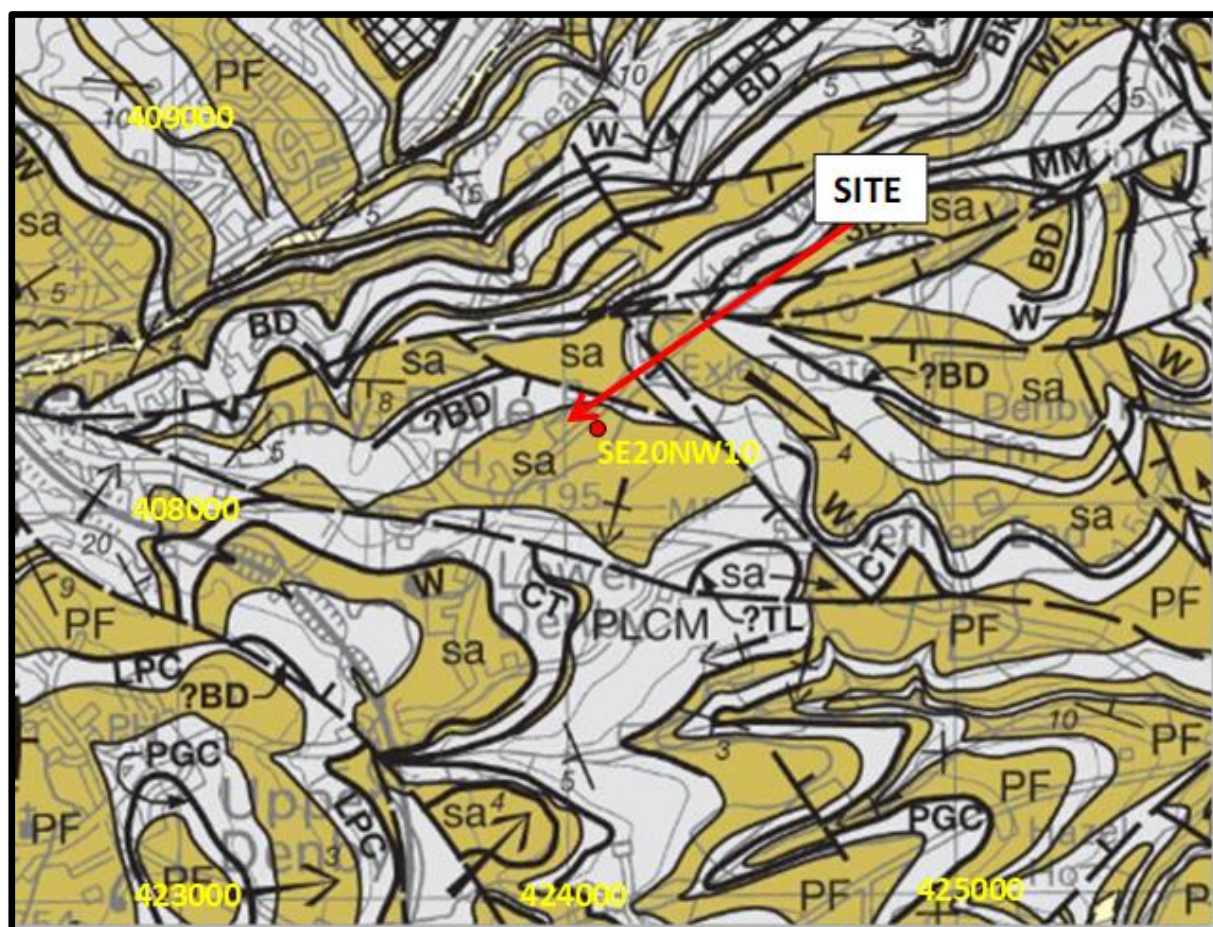
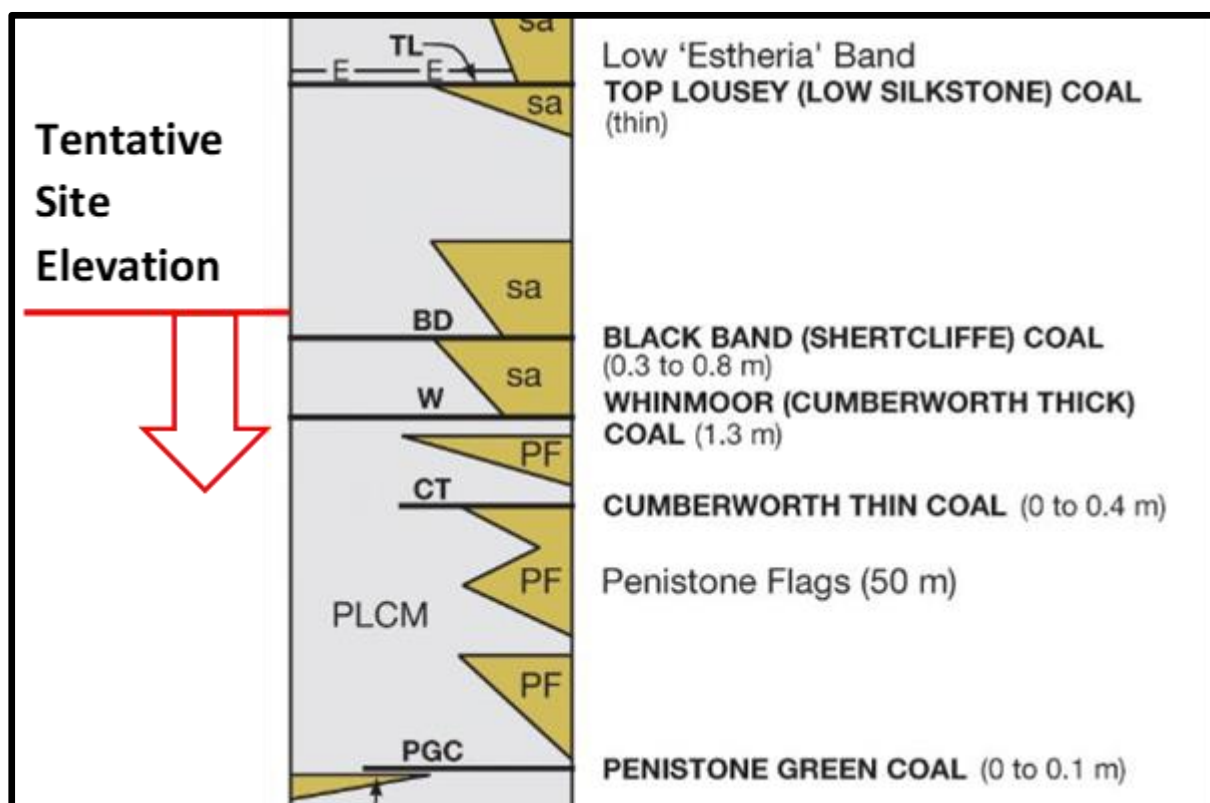


APPENDIX C PROPOSED DEVELOPMENT PLAN



APPENDIX D

EXTRACTS OF BGS GEOLOGY MAP



APPENDIX E

BGS LOG SE20NW/10

For Institute use only

British Geological Survey

British Geological Survey

GEOLOGICAL
CLASSIFICATION

NATURE OF STRATA

THICKNESS

DEPTH

If measurements start below ground surface, state how far.

Feet

Inches

Metres

Feet

Inches

Metres

Made Ground

FILL

0.60

0.60

Head

SANDY CLAY

2.20

2.80

MUDSTONE

1.80

4.60

? Black Band Coal

COAL

0.20

4.80

MUDSTONE SANDSTONE BANDS

9.20

14.00

SANDSTONE

7.60

21.60

Lower

SANDSTONE BROKEN

2.20

23.80

Coal

SANDSTONE

3.20

27.10

Measures

MUDSTONE SANDSTONE BANDS

9.90

37.00

SANDSTONE

5.20

42.20

SANDSTONE MUDSTONE BANDS

17.80

60.00

Dan McBlige

14/10/00

B/HAE DAMP 21.60

WET 40.00