

Earth Environmental & Geotechnical Ltd
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Groundsure Reference: GS-6498261

Your Reference: A3341

Report Date 3 Dec 2019

Report Delivery Method: Email - pdf

Geo Insight

Address: 16, WILLOW COURT, ACREFAIR, WREXHAM, LL14 3UJ

Dear Sir/ Madam,

Thank you for placing your order with Groundsure. Please find enclosed the **Groundsure Geo Insight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 08444 159000 quoting the above Groundsure reference number.

Yours faithfully,

[Redacted signature block]

Managing Director
Groundsure Limited

Enc.
Groundsure Geo Insight

Address: 16, WILLOW COURT, ACREFAIR, WREXHAM, LL14 3UJ

Date: 3 Dec 2019

Reference: GS-6498261

Client: Earth Environmental & Geotechnical Ltd



Aerial Photograph Capture date: 07-May-2017
Grid Reference: 328163,343180
Site Size: 1.1160ha

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Overview of Findings

The Groundsure Geo Insight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 and 1:10,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Non-coal mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database, Johnson Poole and Bloomer mining data and Groundsure's unique database including historical surface ground and underground workings.

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

Section 1: Geology 1:10,000 Scale

1.1 Artificial Ground	1.1 Is there any Artificial Ground/ Made Ground present beneath the study site at 1:10,000 scale?	No
1.2 Superficial Geology and Landslips	1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site at 1:10,000 scale?*	No
	1.2.2 Are there any records of landslide within 500m of the study site boundary at 1:10,000 scale?	No
1.3 Bedrock, Solid Geology and linear features	1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
	1.3.2 Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale?	No

Section 2: Geology 1:50,000 Scale

2.1 Artificial Ground	2.1.1 Is there any Artificial Ground/ Made Ground present beneath the study site?	No
	2.1.2 Are there any records relating to permeability of artificial ground within the study site*boundary?	No
2.2 Superficial Geology and Landslips	2.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
	2.2.2 Are there any records of permeability of superficial ground within 500m of the study site?	Yes
	2.2.3 Are there any records of landslide within 500m of the study site boundary?	No
	2.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No

Section 2: Geology 1:50,000 Scale

2.3 Bedrock, Solid Geology and linear features

2.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.

2.3.2 Are there any records relating to permeability of bedrock ground within the study site boundary?

Yes

2.3.3 Are there any records of linear features within 500m of the study site boundary?

Yes

Section 3: Radon

3. Radon

3.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is in a Radon Affected Area, as between 3 and 5% of properties are above the Action Level.

3.2 Radon Protection

Basic radon protective measures are necessary.

Section 4: Ground Workings

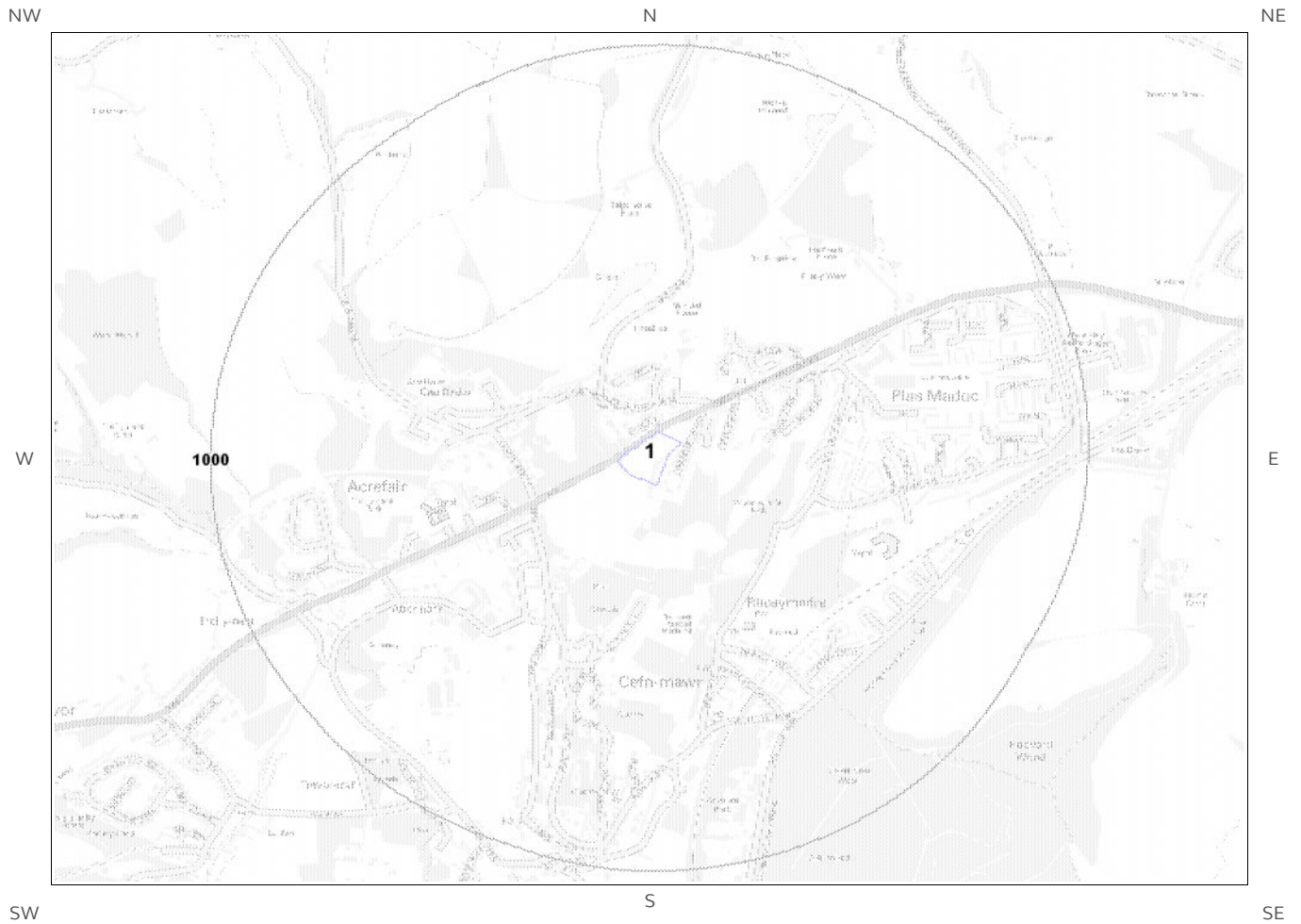
	On-site	0-50m	51-250	251-500	501-1000
4.1 Historical Surface Ground Working Features from Small Scale Mapping	0	22	105	Not Searched	Not Searched
4.2 Historical Underground Workings from Small Scale Mapping	0	0	12	34	137
4.3 Current Ground Workings	0	0	5	12	44

Section 5: Mining, Extraction & Natural Cavities

	On-site	0-50m	51-250	251-500	501-1000
5.1 Historical Mining	0	0	12	34	137
5.2 Coal Mining	1	0	0	0	0
5.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
5.4 Non-Coal Mining*	1	0	0	0	0
5.5 Non-Coal Mining Cavities	0	0	0	0	0
5.5 Natural Cavities	0	0	0	0	0

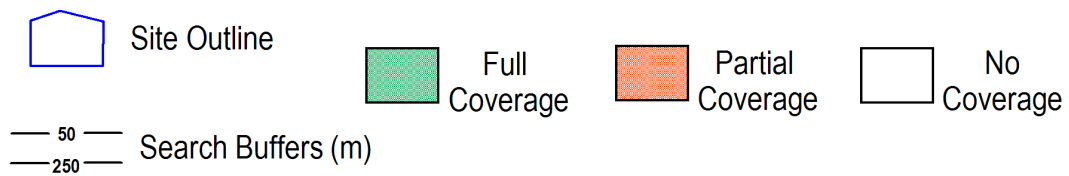
Section 5: Mining, Extraction & Natural Cavities	On-site	0-50m	51-250	251-500	501-1000
5.6 Brine Extraction	0	0	0	0	0
5.7 Gypsum Extraction	0	0	0	0	0
5.8 Cornwall and Devon Metalliferous Mining	0	0	0	0	0
5.9 Clay Mining	0	0	0	0	0
Section 6: Natural Ground Subsidence	On-site				
6.1 Shrink-Swell Clay	Very Low				
6.2 Landslides	Moderate				
6.3 Ground Dissolution of Soluble Rocks	Negligible				
6.4 Compressible Deposits	Negligible				
6.5 Collapsible Deposits	Very Low				
6.5 Running Sand	Very Low				
Section 7: Borehole Records	On-site	0-50m	51-250		
7 BGS Recorded Boreholes	0	0	15		
Section 8: Estimated Background Soil Chemistry	On-site	0-50m	51-250		
8 Records of Background Soil Chemistry	1	1	0		
Section 9: Railways and Tunnels	On-site	0-50m	51-250	250-500	
9.1 Tunnels	0	0	0	Not Searched	
9.2 Historical Railway and Tunnel Features	10	3	26	Not Searched	
9.3 Historical Railways	0	2	8	Not Searched	
9.4 Active Railways	0	0	0	Not Searched	
9.5 Railway Projects	0	0	0	0	

1:10,000 Scale Availability



1_10,000 Availability Legend

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Availability of 1:10,000 Scale Geology Mapping

The following information represents the availability of the key components of the 1:10,000 scale geological data.

ID	Distance	Artificial Coverage	Superficial Coverage	Bedrock Coverage	Mass Movement Coverage
1	0.0	No deposits are mapped	No coverage	No coverage	No coverage
N2	1708.0	Some deposits are mapped	Full	Full	Some deposits are mapped

Guidance: The 1:10,000 scale geological interpretation is the most detailed generally available from BGS and is the scale at which most geological surveying is carried out in the field. The database is presented as four types of geology (artificial, mass movement, superficial and bedrock), although not all themes are mapped or available on every map sheet. Therefore a coverage layer showing the availability of the four themes is presented above.

The definitions of coverage are as follows:

Geology	Full Coverage	Partial Coverage	No Coverage
Bedrock	The whole tile has been mapped	Some but not all the tile has been mapped	No coverage
Superficial	The whole tile has been mapped	Some but not all of the tile has been mapped	No coverage
Artificial	Some deposits are mapped on this tile	-	No deposits are mapped
Mass Movement	Some deposits are mapped on this tile	-	No coverage

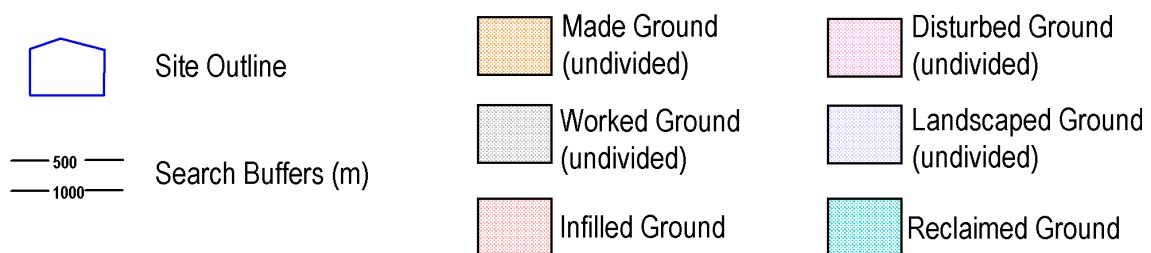
1 Geology (1:10,000 scale).

1.1 Artificial Ground map (1:10,000 scale)



Artificial Ground Legend

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1. Geology 1:10,000 scale

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

Are there any records of Artificial/ Made Ground within 500m of the study site boundary at 1:10,000 scale? No

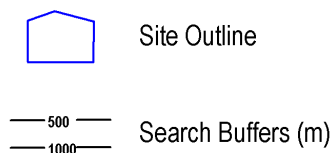
Database searched and no data found.

1.2 Superficial Deposits and Landslips map (1:10,000 scale)



Artificial Ground Legend

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1.2 Superficial Deposits and Landslips

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping

1.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

1.2.2 Landslip

Are there any records of Landslip within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:10,000 scale

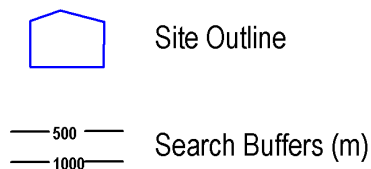
This Geology shows the main components as discrete layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3 Bedrock and linear features map (1:10,000 scale)



Bedrock and linear features Legend

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1.3 Bedrock and linear features

The following geological information represented on the mapping is derived from 1:10,000 scale BGS Geological mapping.

1.3.1 Bedrock/ Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary at 1:10,000 scale.

Database searched and no data found at this scale.

1.3.2 Linear features

Are there any records of linear features within 500m of the study site boundary at 1:10,000 scale? No

Database searched and no data found at this scale.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of great Britain at 1:10,000 scale.

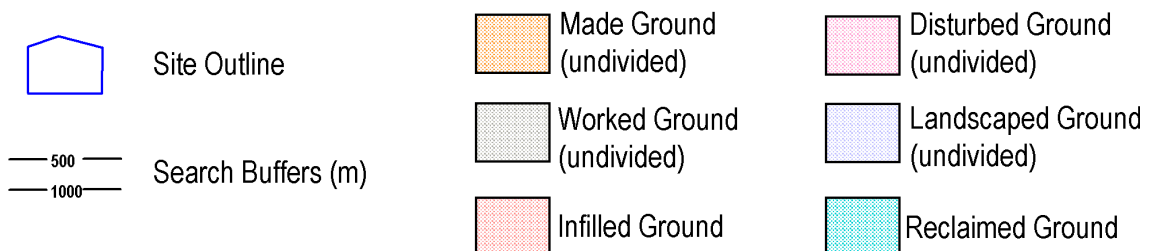
This Geology shows the main components as discrete layers, these are: Bedrock/ Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2 Geology 1:50,000 Scale

2.1 Artificial Ground map



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2. Geology 1:50,000 scale

2.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 121

2.1.1 Artificial/ Made Ground

Are there any records of Artificial/ Made Ground within 500m of the study site boundary? No

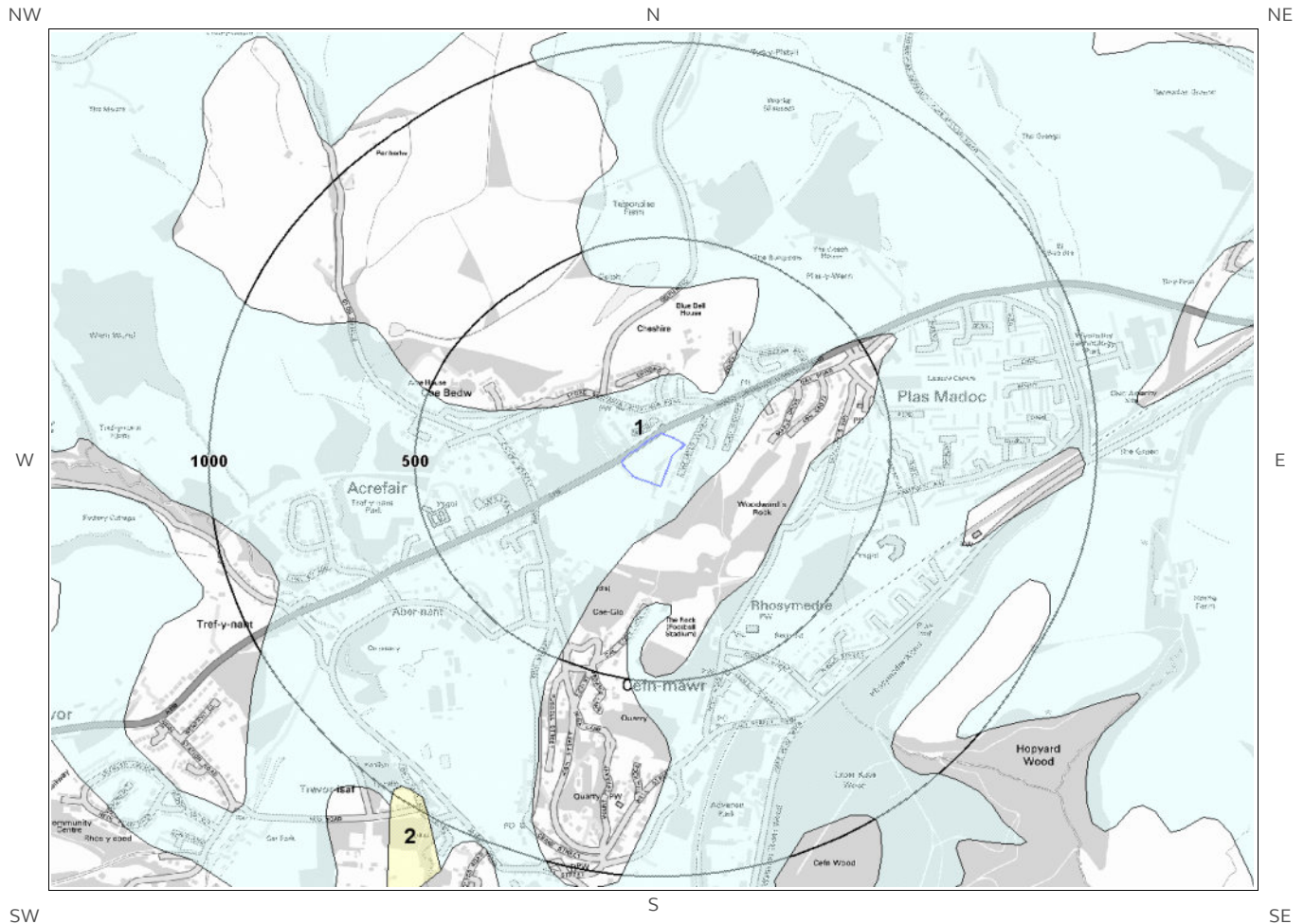
Database searched and no data found.

2.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site boundary? No

Database searched and no data found.

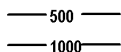
2.2 Superficial Deposits and Landslips map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.2 Superficial Deposits and Landslips

2.2.1 Superficial Deposits/ Drift Geology

Are there any records of Superficial Deposits/ Drift Geology within 500m of the study site boundary? Yes

ID	Distance	Direction	LEX Code	Description	Rock Description
1	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

2.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site boundary? Yes

Distance (m)	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	High	Low

2.2.3 Landslip

Are there any records of Landslip within 500m of the study site boundary? No

Database searched and no data found.

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

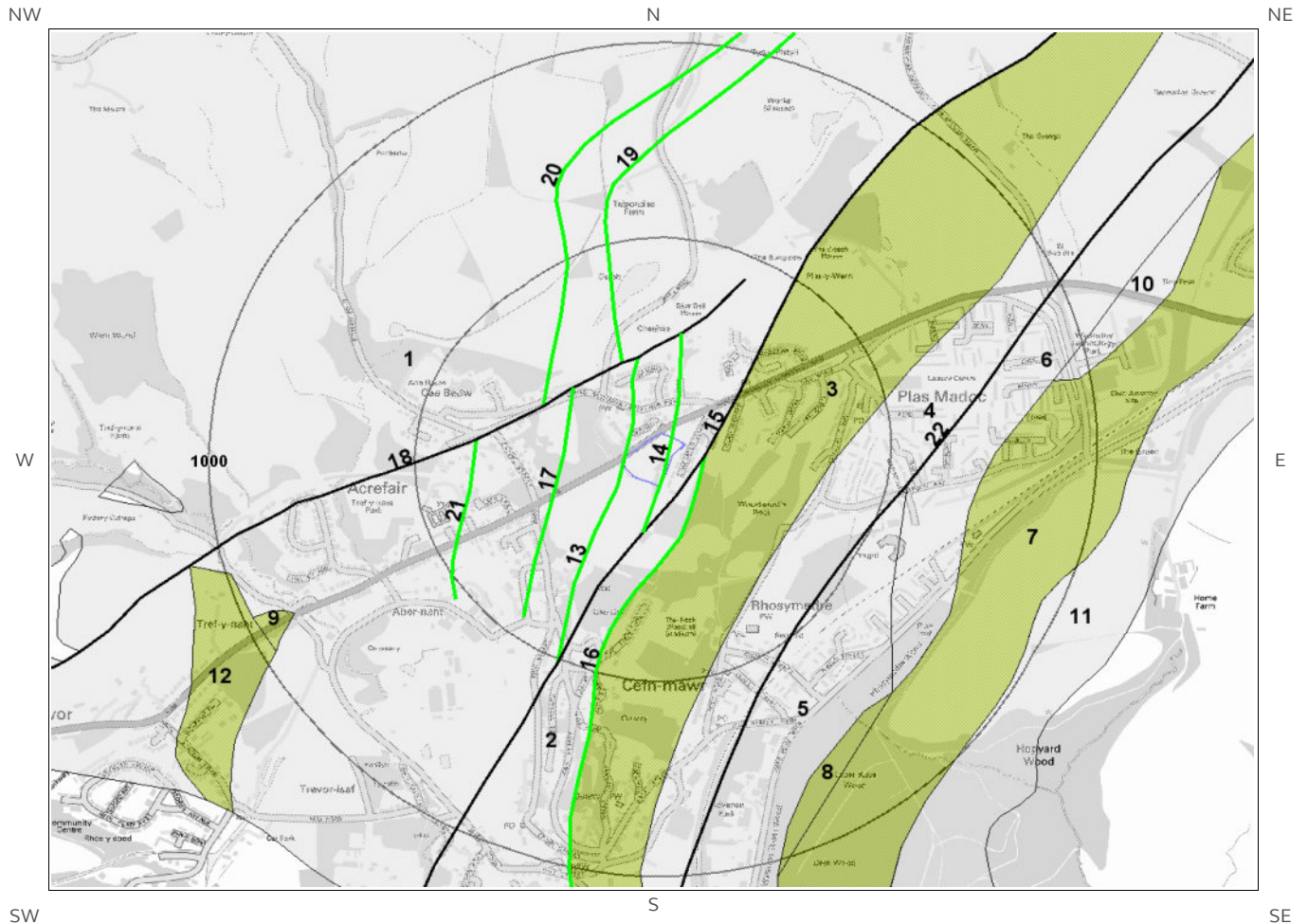
This Geology shows the main components as discrete layers, there are: Artificial/ Made Ground, Superficial/ Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

2.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site boundary? No

Database searched and no data found.

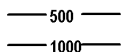
2.3 Bedrock and linear features map (1:50,000 scale)



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Site Outline



Search Buffers (m)

2.3 Bedrock, Solid Geology & linear features

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No: 121

2.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	PLMC-MDSS	PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
2	46.0	SE	PLMC-MDSS	PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
3	57.0	SE	CF-SDST	CEFN ROCK - SANDSTONE	WESTPHALIAN
4	323.0	SE	PLMC-MDSS	PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN
5	474.0	SE	PLMC-MDSS	PENNINE LOWER COAL MEASURES FORMATION AND PENNINE MIDDLE COAL MEASURES FORMATION (UNDIFFERENTIATED) - MUDSTONE, SILTSTONE AND SANDSTONE	WESTPHALIAN

2.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site boundary? Yes

Distance	Direction	Flow Type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Moderate	Low

2.3.3 Linear features

Are there any records of linear features within 500m of the study site boundary? Yes

ID	Distance	Direction	Category Description	Feature Description
13	0.0	On Site	ROCK	Coal seam, inferred
14	0.0	On Site	ROCK	Coal seam, inferred
15	46.0	SE	FAULT	Fault, inferred, displacement unknown

ID	Distance	Direction	Category Description	Feature Description
16	57.0	SE	ROCK	Coal seam, inferred
17	139.0	W	ROCK	Coal seam, inferred
18	200.0	N	FAULT	Fault, inferred, displacement unknown
19	202.0	NW	ROCK	Coal seam, inferred
20	237.0	NW	ROCK	Coal seam, inferred
21	354.0	W	ROCK	Coal seam, inferred
22	474.0	SE	FAULT	Fault, inferred, displacement unknown

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discrete layers, these are: Bedrock/Solid Geology and linear features such as faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nation wide coverage.

3 Radon Data

3.1 Radon Affected Areas

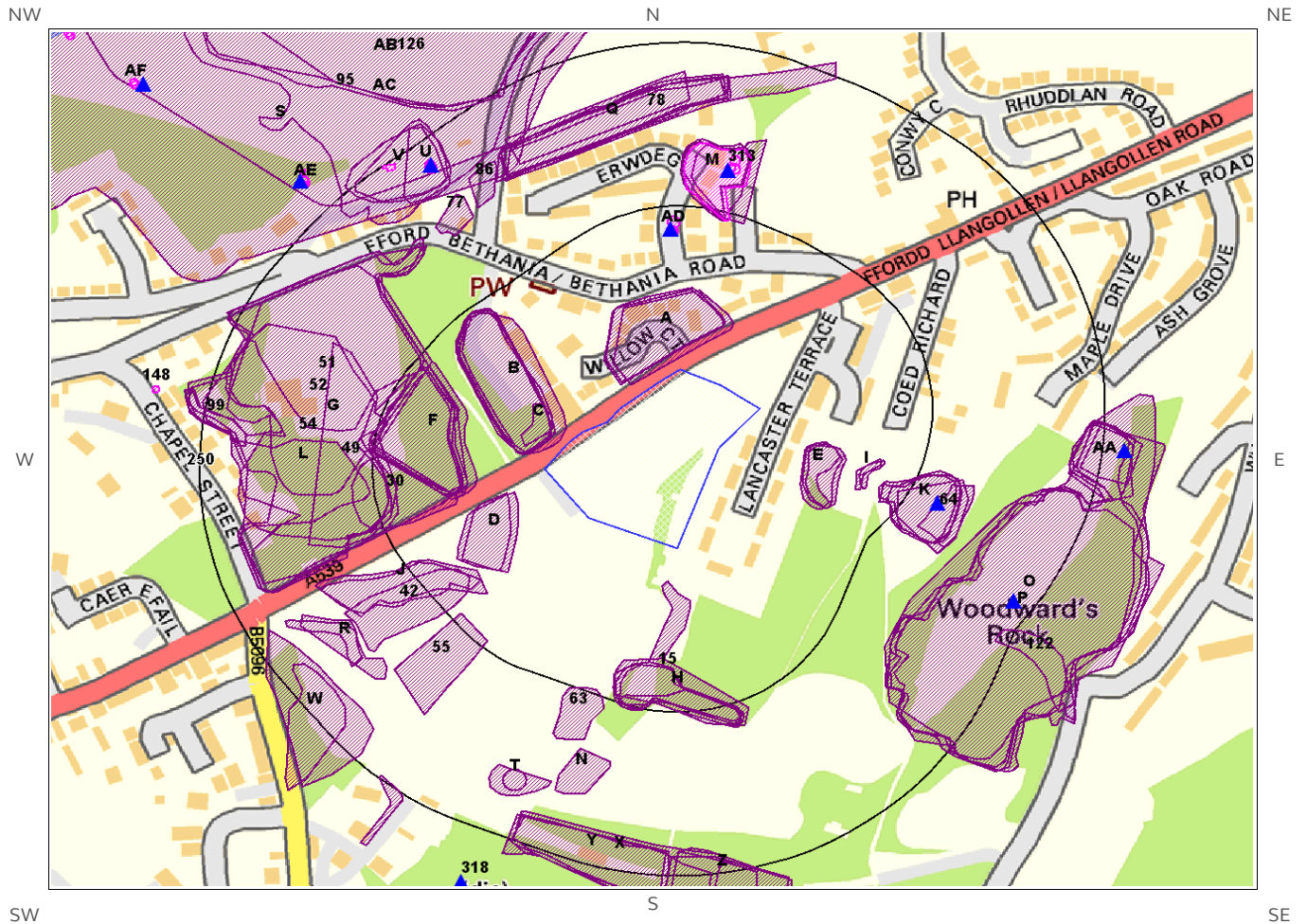
Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 3 and 5% of properties are above the Action Level.

The radon data in this report is supplied by the BGS/Public Health England and is the definitive map of Radon Affected Areas in Great Britain and Northern Ireland. The dataset was created using long-term radon measurements in over 479,000 homes across Great Britain and 23,000 homes across Northern Ireland, combined with geological data. The dataset is considered accurate to 50m to allow for the margin of error in geological lines, and the findings of this report supercede any answer given in the less accurate Indicative Atlas of Radon in Great Britain, which simplifies the data to give the highest risk within any given 1km grid square. As such, the radon atlas is considered indicative, whereas the data given in this report is considered definitive.

3.2 Radon Protection

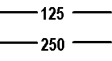
Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment? Basic radon protective measures are necessary.

4 Ground Workings map



Ground Workings Legend

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-  Site Outline
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings
-  Search Buffers (m)

4 Ground Workings

4.1 Historical Surface Ground Working Features derived from Historical Mapping

This dataset is based on Groundsure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Use	Date
1B	6.0	NW	328049 343282	Unspecified Heap	1873
2A	8.0	NW	328164 343317	Reservoir	1898
3A	8.0	NW	328164 343317	Reservoir	1949
4A	8.0	NW	328164 343317	Pond	1873
5B	12.0	NW	328043 343282	Unspecified Heap	1960
6B	13.0	NW	328042 343283	Unspecified Heap	1949
7A	13.0	NW	328157 343317	Reservoir	1910
8A	13.0	NW	328158 343318	Reservoir	1938
9B	13.0	NW	328041 343283	Unspecified Heap	1910
10B	14.0	NW	328043 343282	Unspecified Heap	1938
11B	14.0	NW	328043 343282	Unspecified Heap	1938
12C	16.0	NW	328065 343250	Unspecified Ground Workings	1974
13C	16.0	NW	328065 343250	Unspecified Ground Workings	1994
14C	16.0	NW	328065 343250	Unspecified Ground Workings	1985
15	26.0	S	328155 343076	Unspecified Ground Workings	1910
16D	29.0	SW	328032 343168	Pond	1873
17D	33.0	SW	328027 343168	Pond	1960
18E	45.0	SE	328263 343211	Unspecified Heap	1938
19E	45.0	SE	328263 343211	Unspecified Heap	1938
20E	45.0	SE	328271 343210	Unspecified Heap	1949
21E	48.0	SE	328275 343211	Unspecified Heap	1960

ID	Distance (m)	Direction	NGR	Use	Date
22F	50.0	W	327986 343247	Pond	1873
23F	57.0	W	327981 343244	Reservoirs	1898
24F	57.0	W	327981 343244	Reservoir	1949
25G	57.0	W	327914 343257	Unspecified Ground Workings	1938
26G	57.0	W	327914 343257	Unspecified Ground Workings	1938
27F	60.0	W	327979 343243	Pond	1960
28F	62.0	W	327978 343246	Reservoir	1938
29F	63.0	W	327977 343245	Reservoir	1910
30	67.0	W	327970 343197	Unspecified Heap	1873
31I	85.0	SE	328299 343212	Unspecified Ground Workings	1949
32H	85.0	S	328170 343045	Unspecified Heap	1985
33H	85.0	S	328170 343045	Unspecified Heap	1974
34H	85.0	S	328170 343045	Unspecified Heap	1994
35I	87.0	SE	328302 343212	Unspecified Ground Workings	1960
36J	88.0	SW	327967 343126	Unspecified Heap	1938
37J	88.0	SW	327967 343126	Unspecified Heap	1938
38H	89.0	S	328168 343046	Unspecified Heap	1938
39H	89.0	S	328168 343046	Unspecified Heap	1938
40J	91.0	SW	327967 343124	Unspecified Ground Workings	1949
41H	91.0	S	328169 343043	Unspecified Heap	1949
42	95.0	SW	327971 343108	Unspecified Ground Workings	1873
43K	105.0	SE	328342 343187	Unspecified Old Quarries	1938
44K	106.0	SE	328341 343185	Unspecified Old Quarries	1910
45L	108.0	W	327898 343222	Unspecified Ground Workings	1974
46L	108.0	W	327898 343222	Unspecified Ground Workings	1985
47L	108.0	W	327898 343222	Unspecified Ground Workings	1994
48H	108.0	S	328139 343034	Unspecified Heap	1960
49	109.0	W	327933 343231	Unspecified Heap	1898
50K	112.0	SE	328346 343185	Unspecified Old Quarries	1960

ID	Distance (m)	Direction	NGR	Use	Date
51	113.0	NW	327915 343284	Unspecified Heap	1873
52	113.0	W	327899 343254	Unspecified Ground Workings	1960
53G	115.0	W	327831 343255	Unspecified Ground Workings	1910
54	116.0	W	327900 343244	Unspecified Heap	1949
55	117.0	SW	327996 343067	Cuttings	1873
56M	118.0	N	328194 343436	Unspecified Heap	1910
57M	118.0	N	328194 343436	Unspecified Heap	1949
58K	118.0	SE	328352 343179	Unspecified Old Quarry	1898
59K	118.0	SE	328352 343179	Unspecified Old Quarries	1949
60M	120.0	N	328204 343435	Unspecified Heap	1873
61M	120.0	N	328195 343438	Unspecified Heap	1938
62M	120.0	N	328195 343438	Unspecified Heap	1938
63	121.0	S	328096 343029	Unspecified Ground Workings	1873
64	145.0	SE	328361 343180	Pond	1873
65N	167.0	S	328099 342985	Unspecified Pit	1994
66N	167.0	S	328099 342985	Unspecified Pit	1985
67N	167.0	S	328099 342985	Unspecified Pit	1974
68O	167.0	SE	328415 343133	Refuse Heap	1994
69O	167.0	SE	328415 343133	Refuse Heap	1985
70O	167.0	SE	328415 343133	Refuse Heap	1974
71O	170.0	E	328419 343121	Unspecified Old Quarries	1938
72P	170.0	SE	328411 343118	Unspecified Old Quarries	1910
73P	173.0	E	328416 343093	Unspecified Heap	1873
74P	173.0	E	328416 343093	Unspecified Old Quarry	1898
75P	173.0	E	328416 343093	Unspecified Old Quarries	1949
76P	174.0	SE	328414 343118	Unspecified Old Quarries	1960
77	176.0	NW	328006 343410	Cuttings	1873
78	180.0	NW	328127 343481	Cuttings	1873
79Q	181.0	NW	328123 343476	Cuttings	1960

ID	Distance (m)	Direction	NGR	Use	Date
80Q	182.0	NW	328120 343478	Cuttings	1910
81Q	183.0	N	328120 343476	Cuttings	1949
82R	183.0	SW	327926 343080	Unspecified Pit	1938
83R	183.0	SW	327926 343080	Unspecified Pit	1938
84Q	183.0	N	328120 343479	Cuttings	1938
85R	185.0	SW	327931 343082	Unspecified Ground Workings	1949
86	185.0	NW	328026 343433	Cuttings	1873
87Q	189.0	N	328109 343484	Cuttings	1985
88Q	189.0	N	328109 343484	Cuttings	1974
89S	194.0	NW	327828 343832	Opencast Workings	1974
90S	194.0	NW	327828 343832	Opencast Workings	1985
91T	199.0	S	328049 342978	Unspecified Heap	1910
92T	199.0	S	328053 342978	Unspecified Ground Workings	1873
93AC	208.0	NW	327927 343568	Brick and Tile Works	1873
94U	209.0	NW	327986 343449	Unspecified Heap	1960
95	211.0	NW	327968 343577	Brick and Tile Works	1898
96V	214.0	NW	327963 343448	Unspecified Heap	1910
97U	215.0	NW	327967 343452	Unspecified Heap	1938
98V	215.0	NW	327967 343452	Unspecified Heap	1938
99	217.0	W	327833 343255	Unspecified Ground Workings	1949
100W	219.0	SW	327902 343031	Unspecified Heap	1873
101X	223.0	S	328124 342919	Cuttings	1938
102W	225.0	SW	327905 343019	Unspecified Heap	1938
103W	225.0	SW	327905 343019	Unspecified Heap	1938
104X	226.0	S	328101 342921	Cuttings	1949
105Y	226.0	S	328101 342921	Cuttings	1898
106Y	226.0	S	328101 342921	Cuttings	1873
107Y	226.0	S	328122 342916	Cuttings	1994
108Y	226.0	S	328122 342916	Cuttings	1985

ID	Distance (m)	Direction	NGR	Use	Date
109Y	226.0	S	328122 342916	Cuttings	1974
110Y	226.0	S	328122 342916	Cuttings	1960
111Y	226.0	S	328119 342917	Cuttings	1910
112A A	229.0	E	328473 343222	Unspecified Old Quarries	1949
113Z	229.0	S	328204 342902	Cuttings	1898
114Z	229.0	S	328204 342902	Cuttings	1949
115Z	232.0	S	328193 342903	Cuttings	1873
116Z	236.0	S	328204 342898	Cuttings	1974
117Z	236.0	S	328204 342898	Cuttings	1985
118Z	236.0	S	328204 342898	Cuttings	1994
119Z	236.0	S	328204 342898	Cuttings	1960
120A A	236.0	E	328481 343228	Unspecified Quarry	1898
121A A	236.0	E	328481 343228	Unspecified Pit	1873
122	239.0	E	328436 343067	Cuttings	1873
123AB	245.0	NW	328018 343632	Brick and Tile Works	1938
124AB	245.0	NW	328018 343632	Brick and Tile Works	1938
125	247.0	SW	327959 342955	Unspecified Ground Workings	1910
126	248.0	NW	328027 343608	Brick and Tile Works	1949
127AC	248.0	NW	327944 343608	Brick and Tile Works	1910

4.2 Historical Underground Working Features derived from Historical Mapping

This data is derived from the Groundsure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? Yes

The following Historical Underground Working Features are provided by Groundsure:

ID	Distance (m)	Direction	NGR	Use	Date
128A D	102.0	N	328164 343398	Unspecified Old Shafts	1960

ID	Distance (m)	Direction	NGR	Use	Date
129A D	103.0	N	328163 343398	Old Coal Shafts	1949
130A D	108.0	N	328164 343405	Unspecified Disused Shafts	1985
131A D	108.0	N	328164 343405	Unspecified Disused Shafts	1974
132M	118.0	N	328196 343435	Unspecified Old Shafts	1960
133M	154.0	N	328208 343445	Unspecified Old Shafts	1960
134M	156.0	N	328206 343446	Old Coal Shafts	1949
135M	161.0	N	328209 343452	Unspecified Disused Shafts	1985
136M	161.0	N	328209 343452	Unspecified Disused Shafts	1974
137U	225.0	NW	327988 343446	Unspecified Disused Old Shafts	1960
138U	228.0	NW	327988 343448	Old Coal Shafts	1949
139V	243.0	NW	327959 343446	Coal Shafts	1873
140AE	272.0	NW	327897 343434	Coal Shafts	1873
141AE	272.0	NW	327897 343435	Unspecified Disused Old Shafts	1960
142AE	274.0	NW	327896 343436	Old Coal Shafts	1949
143AE	280.0	NW	327896 343443	Coal Shafts	1873
Not shown	282.0	S	328123 342871	Unspecified Old Shafts	1960
Not shown	285.0	S	328058 342886	Unspecified Disused Shafts	1985
Not shown	285.0	S	328058 342886	Unspecified Disused Shafts	1994
Not shown	285.0	S	328058 342886	Unspecified Disused Shafts	1974
148	285.0	W	327790 343277	Unspecified Old Shaft	1898
Not shown	289.0	S	328060 342883	Unspecified Old Shafts	1960
Not shown	291.0	S	328059 342882	Old Coal Shaft	1949
Not shown	297.0	N	328196 343592	Unspecified Old Shaft	1898
Not shown	297.0	N	328196 343592	Old Coal Shaft	1949
Not shown	299.0	N	328197 343593	Unspecified Old Shaft	1960
Not shown	313.0	S	328006 342877	Unspecified Disused Shafts	1985
Not shown	313.0	S	328006 342877	Unspecified Disused Shafts	1994
Not shown	313.0	S	328006 342877	Unspecified Disused Shafts	1974
Not shown	315.0	S	328008 342874	Unspecified Old Shafts	1960

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	316.0	S	328007 342873	Old Coal Shafts	1949
Not shown	319.0	S	328048 342855	Unspecified Old Shaft	1898
Not shown	320.0	N	328095 343607	Old Coal Shafts	1949
Not shown	324.0	NE	328339 343577	Old Coal Shaft	1949
Not shown	324.0	NE	328342 343577	Unspecified Old Shaft	1960
Not shown	398.0	N	328186 343693	Old Coal Shafts	1949
Not shown	400.0	N	328188 343695	Unspecified Old Shafts	1960
165AF	413.0	NW	327775 343510	Unspecified Shaft	1960
166AF	415.0	NW	327774 343511	Clay Shafts	1949
Not shown	442.0	SW	327909 342778	Unspecified Old Shaft	1898
Not shown	473.0	N	328128 343767	Unspecified Old Shaft	1898
169A G	473.0	NW	327728 343547	Unspecified Shaft	1960
Not shown	475.0	N	328130 343769	Old Coal Shafts	1949
171A G	476.0	NW	327726 343549	Unspecified Shaft	1949
Not shown	477.0	N	328133 343772	Unspecified Old Shafts	1960
Not shown	496.0	SW	327706 342873	Unspecified Shaft	1898
Not shown	507.0	NE	328513 343684	Old Clay Shaft	1960
Not shown	510.0	NE	328510 343689	Old Clay Shaft	1949
Not shown	512.0	NW	327726 343602	Unspecified Shaft	1960
Not shown	513.0	NW	327726 343603	Old Coal Shaft	1949
Not shown	515.0	NE	328514 343693	Old Clay Shaft	1960
Not shown	516.0	W	327554 343263	Old Coal Shaft	1949
Not shown	516.0	W	327554 343263	Unspecified Old Shaft	1898
Not shown	516.0	W	327553 343261	Unspecified Old Shaft	1960
Not shown	518.0	W	327552 343268	Unspecified Disused Shaft	1985
Not shown	518.0	W	327552 343268	Unspecified Disused Shaft	1974
Not shown	518.0	NW	327940 343762	Unspecified Shafts	1898
Not shown	520.0	NW	327941 343762	Old Coal Shafts	1949
Not shown	520.0	SW	327734 342806	Air Shaft	1898

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	520.0	NW	327942 343764	Unspecified Old Shafts	1960
Not shown	527.0	NW	327938 343769	Old Coal Shafts	1949
Not shown	528.0	NW	327940 343771	Unspecified Old Shafts	1960
Not shown	538.0	W	327556 343053	Unspecified Old Shafts	1898
Not shown	546.0	NW	327846 343794	Old Coal Shafts	1949
Not shown	557.0	W	327516 343286	Unspecified Old Shaft	1960
Not shown	558.0	N	327979 343822	Unspecified Shafts	1898
Not shown	573.0	N	327973 343835	Unspecified Shafts	1898
Not shown	575.0	N	327972 343837	Old Coal Shafts	1949
Not shown	576.0	N	327974 343839	Unspecified Old Shafts	1960
Not shown	584.0	NW	327865 343797	Unspecified Disused Shafts	1960
Not shown	584.0	NW	327710 343685	Unspecified Old Shafts	1960
Not shown	604.0	NW	327822 343792	Unspecified Shafts	1898
Not shown	606.0	NW	327817 343791	Unspecified Old Shafts	1960
Not shown	607.0	NW	327815 343789	Old Coal Shaft	1949
Not shown	615.0	NW	327648 343670	Unspecified Shafts	1898
Not shown	618.0	NW	327643 343670	Unspecified Old Shafts	1960
Not shown	619.0	NW	327642 343670	Old Coal Shafts	1949
Not shown	623.0	NW	327739 343755	Unspecified Old Shafts	1960
Not shown	623.0	NW	327737 343754	Old Coal Shafts	1949
Not shown	623.0	NW	327903 343860	Unspecified Shafts	1898
Not shown	623.0	NW	327903 343860	Old Coal Shafts	1949
Not shown	629.0	N	328195 343923	Old Coal Shafts	1949
Not shown	629.0	NW	327772 343786	Old Coal Shafts	1949
Not shown	630.0	NW	327773 343788	Unspecified Old Shafts	1960
Not shown	630.0	N	328198 343925	Unspecified Old Shafts	1960
Not shown	632.0	N	327953 343890	Unspecified Shafts	1898
Not shown	644.0	N	328077 343933	Unspecified Shafts	1898
Not shown	648.0	N	328077 343936	Old Coal Shafts	1949

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	649.0	N	328079 343938	Unspecified Old Shafts	1960
Not shown	651.0	W	327429 343095	Unspecified Old Shafts	1898
Not shown	654.0	NW	327651 343726	Unspecified Old Shafts	1960
Not shown	654.0	NW	327650 343725	Old Coal Shafts	1949
Not shown	659.0	NW	327595 343677	Unspecified Old Shafts	1960
Not shown	659.0	N	328016 343937	Unspecified Shafts	1898
Not shown	659.0	NW	327594 343677	Old Coal Shafts	1949
Not shown	664.0	N	328016 343942	Old Coal Shaft	1949
Not shown	665.0	N	328017 343944	Unspecified Old Shafts	1960
Not shown	666.0	NE	328734 343701	Unspecified Disused Shaft	1985
Not shown	666.0	NE	328734 343701	Unspecified Disused Shaft	1994
Not shown	666.0	NE	328734 343701	Unspecified Disused Shaft	1974
Not shown	672.0	NW	327810 343865	Old Coal Shaft	1949
Not shown	672.0	NW	327810 343865	Unspecified Shafts	1898
Not shown	677.0	NW	327843 343890	Unspecified Shafts	1898
Not shown	677.0	NW	327843 343890	Old Coal Shaft	1949
Not shown	681.0	NW	327748 343834	Old Coal Shafts	1949
Not shown	681.0	NW	327748 343834	Unspecified Shafts	1898
Not shown	681.0	NW	327846 343896	Unspecified Old Shaft	1960
Not shown	686.0	NW	327745 343837	Unspecified Old Shaft	1960
Not shown	688.0	NW	327468 343550	Unspecified Old Shaft	1960
Not shown	694.0	NW	327882 343928	Unspecified Shafts	1898
Not shown	697.0	NW	327883 343932	Unspecified Old Shaft	1960
Not shown	697.0	NW	327882 343930	Old Coal Shaft	1949
Not shown	699.0	N	327945 343958	Unspecified Shafts	1898
Not shown	703.0	SW	327688 342608	Unspecified Old Shaft	1898
Not shown	710.0	NW	327709 343842	Old Coal Shafts	1949
Not shown	710.0	NW	327709 343842	Unspecified Shafts	1898
Not shown	712.0	NW	327708 343843	Unspecified Old Shafts	1960

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	723.0	NW	327735 343877	Old Coal Shafts	1949
Not shown	723.0	NW	327735 343877	Unspecified Shafts	1898
Not shown	723.0	W	327386 343456	Unspecified Shaft	1949
Not shown	727.0	NW	327734 343880	Unspecified Old Shafts	1960
Not shown	731.0	W	327385 343478	Unspecified Shaft	1960
Not shown	734.0	W	327381 343479	Clay Shafts	1949
Not shown	742.0	N	328334 344023	Old Coal Shaft	1949
Not shown	749.0	N	328337 344024	Unspecified Old Shaft	1960
Not shown	755.0	NW	327412 343592	Unspecified Old Shaft	1960
Not shown	760.0	NW	327407 343593	Old Coal Shaft	1949
Not shown	763.0	NW	327660 343876	Unspecified Old Shafts	1960
Not shown	764.0	N	327937 344024	Unspecified Shafts	1898
Not shown	769.0	N	327939 344030	Old Coal Shafts	1949
Not shown	770.0	N	327940 344031	Unspecified Old Shafts	1960
Not shown	771.0	NW	327776 343959	Unspecified Shafts	1898
Not shown	771.0	NW	327776 343959	Old Coal Shafts	1949
Not shown	777.0	NW	327454 343692	Unspecified Old Shafts	1898
Not shown	779.0	NW	327473 343722	Unspecified Old Shafts	1960
Not shown	780.0	NW	327474 343723	Unspecified Old Shafts	1898
Not shown	780.0	NW	327474 343723	Old Coal Shafts	1949
Not shown	804.0	NW	327746 343981	Unspecified Shafts	1898
Not shown	804.0	NW	327746 343981	Old Coal Shafts	1949
Not shown	807.0	NW	327744 343984	Unspecified Old Shafts	1960
Not shown	812.0	NW	327809 344024	Old Coal Shafts	1949
Not shown	812.0	NW	327809 344024	Unspecified Shafts	1898
Not shown	814.0	NW	327804 344023	Unspecified Old Shafts	1960
Not shown	815.0	W	327253 343179	Unspecified Old Shaft	1960
Not shown	817.0	W	327251 343184	Unspecified Disused Shaft	1974
Not shown	817.0	W	327251 343184	Unspecified Disused Shaft	1994

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	817.0	W	327251 343184	Unspecified Disused Shaft	1985
Not shown	818.0	W	327250 343182	Old Coal Shaft	1949
Not shown	818.0	W	327250 343182	Unspecified Old Shaft	1898
Not shown	840.0	NW	327358 343667	Unspecified Shaft	1960
Not shown	842.0	NW	327354 343665	Clay Shafts	1949
Not shown	844.0	NW	327474 343820	Unspecified Old Shafts	1960
Not shown	844.0	NW	327475 343822	Unspecified Old Shafts	1898
Not shown	844.0	NW	327475 343822	Old Coal Shafts	1949
Not shown	849.0	SW	327349 342761	Unspecified Disused Shaft	1994
Not shown	849.0	SW	327349 342761	Unspecified Disused Shaft	1974
Not shown	849.0	SW	327349 342761	Unspecified Disused Shaft	1985
Not shown	855.0	N	328317 344138	Old Coal Shaft	1949
Not shown	855.0	N	328317 344138	Unspecified Old Shaft	1898
Not shown	859.0	N	328322 344141	Unspecified Old Shaft	1960
Not shown	859.0	N	328118 344154	Unspecified Old Shaft	1898
Not shown	860.0	N	328117 344154	Old Coal Shaft	1949
Not shown	861.0	N	328120 344155	Unspecified Old Shaft	1960
Not shown	863.0	N	328317 344147	Unspecified Disused Shaft	1985
Not shown	863.0	N	328317 344147	Unspecified Disused Shaft	1974
Not shown	863.0	N	328317 344147	Unspecified Disused Shaft	1994
Not shown	880.0	S	328343 342141	Colliery	1898
Not shown	880.0	S	328343 342141	Disused Colliery	1949
Not shown	906.0	SW	327626 342403	Unspecified Old Shaft	1898
Not shown	935.0	NW	327363 343830	Unspecified Old Shaft	1960
Not shown	936.0	NW	327359 343828	Old Coal Shaft	1949
Not shown	939.0	SW	327264 342732	Unspecified Shaft	1873
Not shown	944.0	NW	327368 343851	Unspecified Old Shafts	1898
Not shown	955.0	E	329346 343325	Colliery	1873
Not shown	969.0	E	329411 343417	Colliery	1949

ID	Distance (m)	Direction	NGR	Use	Date
Not shown	977.0	S	328366 342196	Unspecified Shaft	1898
Not shown	977.0	NW	327385 343919	Old Coal Shaft	1949
Not shown	977.0	NW	327385 343919	Unspecified Old Shafts	1898
Not shown	978.0	E	329413 343360	Unspecified Disused Mine	1960
Not shown	983.0	NW	327382 343924	Unspecified Old Shaft	1960
Not shown	984.0	NW	327378 343922	Unspecified Disused Shaft	1994
Not shown	984.0	NW	327378 343922	Unspecified Disused Shaft	1985
Not shown	984.0	NW	327378 343922	Unspecified Disused Shaft	1974

4.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? Yes

The following Current Ground Workings information is provided by British Geological Survey:

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
311AD	107.0	N	328162 343399	Coal, Deep	Hughes's Row	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
312K	147.0	SE	328355 343190	Sandstone	Acrefair Quarries	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
313	156.0	N	328203 343444	Coal, Deep	Hughes's Row	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
314U	231.0	NW	327988 343448	Coal, Deep	Delph	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
315O	235.0	SE	328410 343115	Sandstone	Acrefair Quarry	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
316AA	265.0	E	328490 343230	Sandstone	Acrefair Quarries	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
317AE	279.0	NW	327894 343436	Coal, Deep	Delph	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
318	294.0	S	328010 342900	Coal, Deep	Caeglo Colliery, Bye Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	302.0	S	328280 342875	Sandstone	Cefn Stone Quarries, No.2	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	305.0	N	328197 343596	Coal, Deep	Blue Bell Inn	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	316.0	S	328055 342860	Coal, Deep	Caeglo Colliery, Wards Deep Engine Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	332.0	NE	328342 343579	Coal, Deep	Cheshire Farm	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	385.0	S	328230 342775	Sandstone	Cefn Stone Quarries, No. 2	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	405.0	N	328186 343697	Coal, Deep	Depth House	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
325AF	412.0	NW	327780 343510	Fireclay	Penbedw Fireclay Works	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	416.0	NW	327875 343595	Clay & Shale	Delph Brick & Tile Works	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	499.0	SW	327706 342875	Coal, Deep	Plas Kynaston	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	514.0	NE	328512 343689	Coal, Deep	Plas-yn-wern Villa	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	516.0	SW	327700 342855	Clay & Shale	Edward's Clay Pit	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	517.0	NW	327728 343607	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	538.0	SW	327777 342750	Coal, Deep	Plas-aber-nant	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

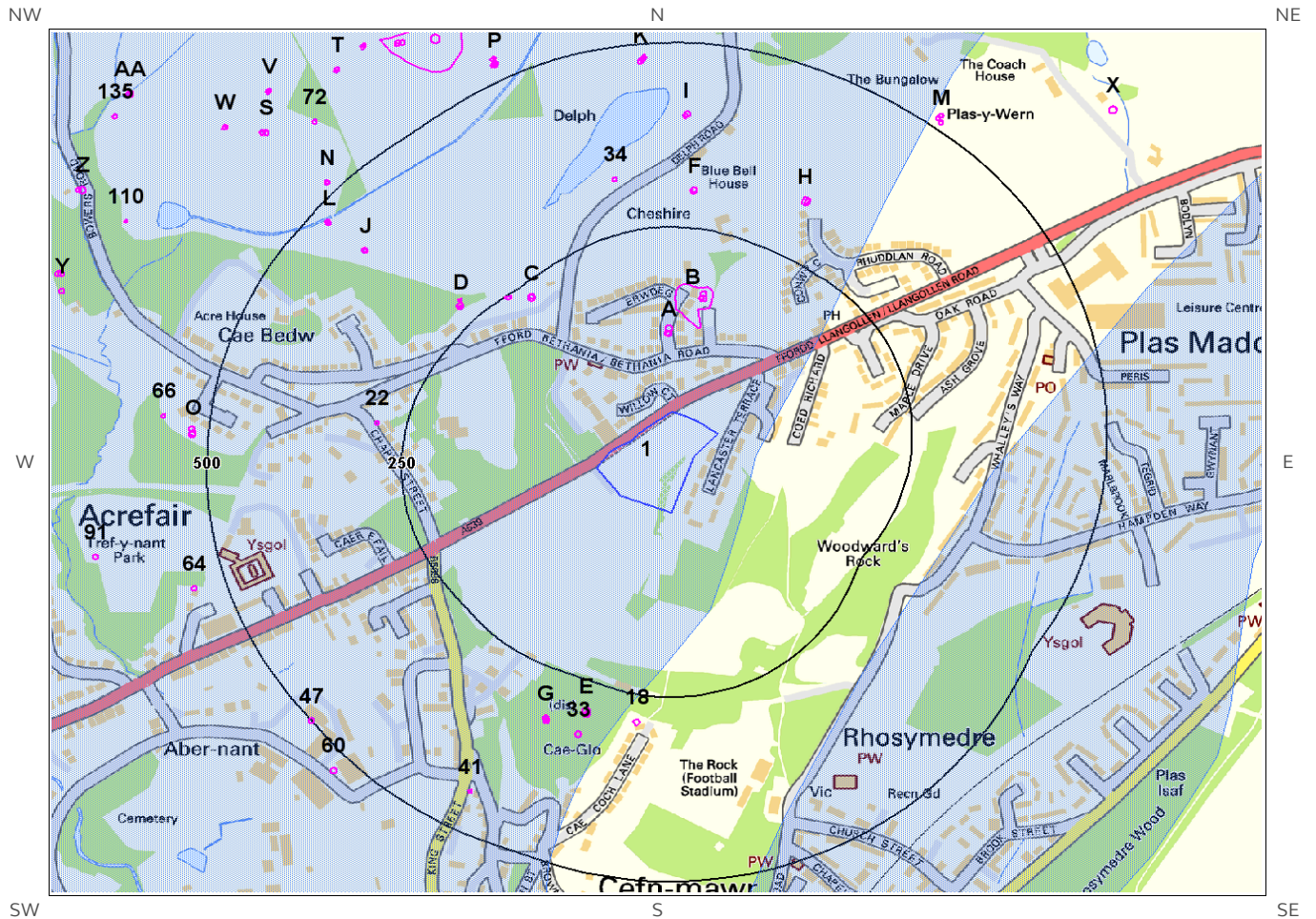
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	567.0	W	327514 343109	Coal, Deep	Tre-y-nant Hall	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	582.0	N	327972 343840	Coal, Deep	Delph	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	588.0	NW	327865 343796	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	608.0	S	328110 342550	Sandstone	Cefn Stone Quarries, No. 1	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	613.0	NW	327660 343675	Fireclay	Penbedw Fireclay Workst	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	628.0	S	328037 342541	Sandstone	Cefn Stone Quarries	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	633.0	N	328198 343924	Coal, Deep	Delph House	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	633.0	NW	327772 343788	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	640.0	N	327955 343895	Coal, Deep	Delph	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	654.0	N	328075 343939	Coal, Deep	Delph	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	655.0	NW	327654 343727	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	658.0	NW	327597 343674	Coal, Deep	Penbedw	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	663.0	NE	328760 343655	Coal, Deep	Plas-yn-Wern Shaft	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	670.0	N	328015 343944	Coal, Deep	Delph	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	672.0	NW	327734 343808	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	684.0	NW	327844 343894	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	685.0	NW	327752 343837	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	701.0	NW	327883 343932	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	703.0	SW	327690 342609	Coal, Deep	Plas Kynaston	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	706.0	N	327943 343961	Coal, Deep	Delph	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	713.0	NW	327715 343845	Fireclay	Penbedw Fireclay Works	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	725.0	W	327385 343450	Coal, Deep	Penbedw Fireclay Works, Coal Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	727.0	NW	327735 343877	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	733.0	W	327385 343475	Fireclay	Penbedw Fireclay Works	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	746.0	N	328330 344021	Coal, Deep	Sycamore Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	764.0	NW	327405 343590	Coal, Deep	Penbedw Fireclay Works Coal Pit	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	774.0	S	327996 342400	Sandstone	Cefn Mawr	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	777.0	N	327937 344034	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	787.0	NW	327474 343729	Coal, Deep	Penbedw	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	820.0	NW	327808 344029	Coal, Deep	Delph Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	844.0	S	327964 342336	Sandstone	Cefn Stone Quarries	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	845.0	NW	327355 343665	Fireclay	Penbedw Fireclay Works	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	851.0	NW	327476 343828	Coal, Deep	Penbedw	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	865.0	N	328318 344144	Coal, Deep	Sycamore Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	872.0	N	328120 344163	Coal, Deep	West Cottages	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	907.0	SW	327628 342406	Coal, Deep	Mill Inn	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	909.0	E	329135 343260	Sandstone	Plas Madoc Lodge	A surface mineral working. It may be termed Quarry, Sand Pit, Clay Pit or Opencast Coal Site	Ceased
Not shown	952.0	NW	327367 343857	Coal, Deep	Penbedw	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

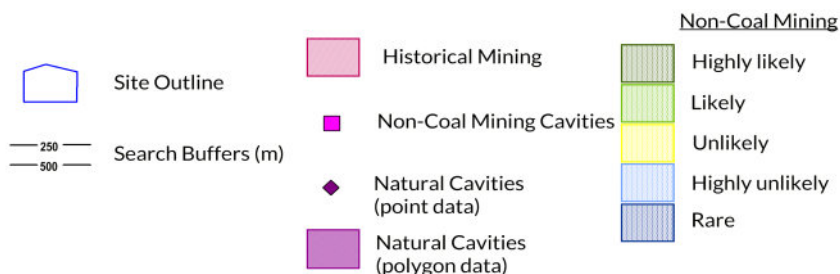
ID	Distance (m)	Direction	NGR	Commodity Produced	Pit Name	Type of working	Status
Not shown	988.0	NW	327375 343920	Coal, Deep	Penbedw	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased
Not shown	992.0	S	328350 342180	Coal, Deep	Plas Kynaston Colliery	Working is wholly underground, access by shaft, adit or drift. Working may be termed Colliery, Mine, Drift Mine, Slant, Level, Adit or Ingoing Eye (Ingaun Ee - Scots)	Ceased

5 Mining, Extraction & Natural Cavities map



Mining, Extraction and
Natural Cavities Legend

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5 Mining, Extraction & Natural Cavities

5.1 Historical Mining

This dataset is derived from Groundsure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary? Yes

The following Historical Mining information is provided by Groundsure:

ID	Distance (m)	Direction	NGR	Details	Date
2A	102.0	N	328164 343398	Unspecified Old Shafts	1960
3A	103.0	N	328163 343398	Old Coal Shafts	1949
4A	108.0	N	328164 343405	Unspecified Disused Shafts	1985
5A	108.0	N	328164 343405	Unspecified Disused Shafts	1974
6B	118.0	N	328196 343435	Unspecified Old Shafts	1960
7B	154.0	N	328208 343445	Unspecified Old Shafts	1960
8B	156.0	N	328206 343446	Old Coal Shafts	1949
9B	161.0	N	328209 343452	Unspecified Disused Shafts	1974
10B	161.0	N	328209 343452	Unspecified Disused Shafts	1985
11C	225.0	NW	327988 343446	Unspecified Disused Old Shafts	1960
12C	228.0	NW	327988 343448	Old Coal Shafts	1949
13C	243.0	NW	327959 343446	Coal Shafts	1873
14D	272.0	NW	327897 343434	Coal Shafts	1873
15D	272.0	NW	327897 343435	Unspecified Disused Old Shafts	1960
16D	274.0	NW	327896 343436	Old Coal Shafts	1949
17D	280.0	NW	327896 343443	Coal Shafts	1873
18	282.0	S	328123 342871	Unspecified Old Shafts	1960
19E	285.0	S	328058 342886	Unspecified Disused Shafts	1994
20E	285.0	S	328058 342886	Unspecified Disused Shafts	1985
21E	285.0	S	328058 342886	Unspecified Disused Shafts	1974

ID	Distance (m)	Direction	NGR	Details	Date
22	285.0	W	327790 343277	Unspecified Old Shaft	1898
23E	289.0	S	328060 342883	Unspecified Old Shafts	1960
24E	291.0	S	328059 342882	Old Coal Shaft	1949
25F	297.0	N	328196 343592	Old Coal Shaft	1949
26F	297.0	N	328196 343592	Unspecified Old Shaft	1898
27F	299.0	N	328197 343593	Unspecified Old Shaft	1960
28G	313.0	S	328006 342877	Unspecified Disused Shafts	1994
29G	313.0	S	328006 342877	Unspecified Disused Shafts	1974
30G	313.0	S	328006 342877	Unspecified Disused Shafts	1985
31G	315.0	S	328008 342874	Unspecified Old Shafts	1960
32G	316.0	S	328007 342873	Old Coal Shafts	1949
33	319.0	S	328048 342855	Unspecified Old Shaft	1898
34	320.0	N	328095 343607	Old Coal Shafts	1949
35H	324.0	NE	328339 343577	Old Coal Shaft	1949
36H	324.0	NE	328342 343577	Unspecified Old Shaft	1960
37I	398.0	N	328186 343693	Old Coal Shafts	1949
38I	400.0	N	328188 343695	Unspecified Old Shafts	1960
39J	413.0	NW	327775 343510	Unspecified Shaft	1960
40J	415.0	NW	327774 343511	Clay Shafts	1949
41	442.0	SW	327909 342778	Unspecified Old Shaft	1898
42K	473.0	N	328128 343767	Unspecified Old Shaft	1898
43L	473.0	NW	327728 343547	Unspecified Shaft	1960
44K	475.0	N	328130 343769	Old Coal Shafts	1949
45L	476.0	NW	327726 343549	Unspecified Shaft	1949
46K	477.0	N	328133 343772	Unspecified Old Shafts	1960
47	496.0	SW	327706 342873	Unspecified Shaft	1898
48M	507.0	NE	328513 343684	Old Clay Shaft	1960
49M	510.0	NE	328510 343689	Old Clay Shaft	1949
50N	512.0	NW	327726 343602	Unspecified Shaft	1960

ID	Distance (m)	Direction	NGR	Details	Date
51N	513.0	NW	327726 343603	Old Coal Shaft	1949
52M	515.0	NE	328514 343693	Old Clay Shaft	1960
53O	516.0	W	327554 343263	Old Coal Shaft	1949
54O	516.0	W	327554 343263	Unspecified Old Shaft	1898
55O	516.0	W	327553 343261	Unspecified Old Shaft	1960
56O	518.0	W	327552 343268	Unspecified Disused Shaft	1985
57O	518.0	W	327552 343268	Unspecified Disused Shaft	1974
58P	518.0	NW	327940 343762	Unspecified Shafts	1898
59P	520.0	NW	327941 343762	Old Coal Shafts	1949
60	520.0	SW	327734 342806	Air Shaft	1898
61P	520.0	NW	327942 343764	Unspecified Old Shafts	1960
62P	527.0	NW	327938 343769	Old Coal Shafts	1949
63P	528.0	NW	327940 343771	Unspecified Old Shafts	1960
64	538.0	W	327556 343053	Unspecified Old Shafts	1898
65Q	546.0	NW	327846 343794	Old Coal Shafts	1949
66	557.0	W	327516 343286	Unspecified Old Shaft	1960
Not shown	558.0	N	327979 343822	Unspecified Shafts	1898
Not shown	573.0	N	327973 343835	Unspecified Shafts	1898
Not shown	575.0	N	327972 343837	Old Coal Shafts	1949
Not shown	576.0	N	327974 343839	Unspecified Old Shafts	1960
71Q	584.0	NW	327865 343797	Unspecified Disused Shafts	1960
72	584.0	NW	327710 343685	Unspecified Old Shafts	1960
73R	604.0	NW	327822 343792	Unspecified Shafts	1898
74R	606.0	NW	327817 343791	Unspecified Old Shafts	1960
75R	607.0	NW	327815 343789	Old Coal Shaft	1949
76S	615.0	NW	327648 343670	Unspecified Shafts	1898
77S	618.0	NW	327643 343670	Unspecified Old Shafts	1960
78S	619.0	NW	327642 343670	Old Coal Shafts	1949
79T	623.0	NW	327739 343755	Unspecified Old Shafts	1960

ID	Distance (m)	Direction	NGR	Details	Date
80T	623.0	NW	327737 343754	Old Coal Shafts	1949
Not shown	623.0	NW	327903 343860	Unspecified Shafts	1898
Not shown	623.0	NW	327903 343860	Old Coal Shafts	1949
Not shown	629.0	N	328195 343923	Old Coal Shafts	1949
84U	629.0	NW	327772 343786	Old Coal Shafts	1949
85U	630.0	NW	327773 343788	Unspecified Old Shafts	1960
Not shown	630.0	N	328198 343925	Unspecified Old Shafts	1960
Not shown	632.0	N	327953 343890	Unspecified Shafts	1898
Not shown	644.0	N	328077 343933	Unspecified Shafts	1898
Not shown	648.0	N	328077 343936	Old Coal Shafts	1949
Not shown	649.0	N	328079 343938	Unspecified Old Shafts	1960
91	651.0	W	327429 343095	Unspecified Old Shafts	1898
92V	654.0	NW	327651 343726	Unspecified Old Shafts	1960
93V	654.0	NW	327650 343725	Old Coal Shafts	1949
94W	659.0	NW	327595 343677	Unspecified Old Shafts	1960
Not shown	659.0	N	328016 343937	Unspecified Shafts	1898
96W	659.0	NW	327594 343677	Old Coal Shafts	1949
Not shown	664.0	N	328016 343942	Old Coal Shaft	1949
Not shown	665.0	N	328017 343944	Unspecified Old Shafts	1960
99X	666.0	NE	328734 343701	Unspecified Disused Shaft	1974
100X	666.0	NE	328734 343701	Unspecified Disused Shaft	1994
101X	666.0	NE	328734 343701	Unspecified Disused Shaft	1985
Not shown	672.0	NW	327810 343865	Unspecified Shafts	1898
Not shown	672.0	NW	327810 343865	Old Coal Shaft	1949
Not shown	677.0	NW	327843 343890	Old Coal Shaft	1949
Not shown	677.0	NW	327843 343890	Unspecified Shafts	1898
Not shown	681.0	NW	327748 343834	Old Coal Shafts	1949
Not shown	681.0	NW	327748 343834	Unspecified Shafts	1898
Not shown	681.0	NW	327846 343896	Unspecified Old Shaft	1960

ID	Distance (m)	Direction	NGR	Details	Date
Not shown	686.0	NW	327745 343837	Unspecified Old Shaft	1960
110	688.0	NW	327468 343550	Unspecified Old Shaft	1960
Not shown	694.0	NW	327882 343928	Unspecified Shafts	1898
Not shown	697.0	NW	327883 343932	Unspecified Old Shaft	1960
Not shown	697.0	NW	327882 343930	Old Coal Shaft	1949
Not shown	699.0	N	327945 343958	Unspecified Shafts	1898
Not shown	703.0	SW	327688 342608	Unspecified Old Shaft	1898
Not shown	710.0	NW	327709 343842	Old Coal Shafts	1949
Not shown	710.0	NW	327709 343842	Unspecified Shafts	1898
Not shown	712.0	NW	327708 343843	Unspecified Old Shafts	1960
Not shown	723.0	NW	327735 343877	Unspecified Shafts	1898
Not shown	723.0	NW	327735 343877	Old Coal Shafts	1949
121Y	723.0	W	327386 343456	Unspecified Shaft	1949
Not shown	727.0	NW	327734 343880	Unspecified Old Shafts	1960
123Y	731.0	W	327385 343478	Unspecified Shaft	1960
124Y	734.0	W	327381 343479	Clay Shafts	1949
Not shown	742.0	N	328334 344023	Old Coal Shaft	1949
Not shown	749.0	N	328337 344024	Unspecified Old Shaft	1960
127Z	755.0	NW	327412 343592	Unspecified Old Shaft	1960
128Z	760.0	NW	327407 343593	Old Coal Shaft	1949
Not shown	763.0	NW	327660 343876	Unspecified Old Shafts	1960
Not shown	764.0	N	327937 344024	Unspecified Shafts	1898
Not shown	769.0	N	327939 344030	Old Coal Shafts	1949
Not shown	770.0	N	327940 344031	Unspecified Old Shafts	1960
Not shown	771.0	NW	327776 343959	Unspecified Shafts	1898
Not shown	771.0	NW	327776 343959	Old Coal Shafts	1949
135	777.0	NW	327454 343692	Unspecified Old Shafts	1898
136AA	779.0	NW	327473 343722	Unspecified Old Shafts	1960
137AA	780.0	NW	327474 343723	Old Coal Shafts	1949

ID	Distance (m)	Direction	NGR	Details	Date
138AA	780.0	NW	327474 343723	Unspecified Old Shafts	1898
Not shown	804.0	NW	327746 343981	Unspecified Shafts	1898
Not shown	804.0	NW	327746 343981	Old Coal Shafts	1949
Not shown	807.0	NW	327744 343984	Unspecified Old Shafts	1960
Not shown	812.0	NW	327809 344024	Unspecified Shafts	1898
Not shown	812.0	NW	327809 344024	Old Coal Shafts	1949
Not shown	814.0	NW	327804 344023	Unspecified Old Shafts	1960
Not shown	815.0	W	327253 343179	Unspecified Old Shaft	1960
Not shown	817.0	W	327251 343184	Unspecified Disused Shaft	1985
Not shown	817.0	W	327251 343184	Unspecified Disused Shaft	1994
Not shown	817.0	W	327251 343184	Unspecified Disused Shaft	1974
Not shown	818.0	W	327250 343182	Old Coal Shaft	1949
Not shown	818.0	W	327250 343182	Unspecified Old Shaft	1898
Not shown	840.0	NW	327358 343667	Unspecified Shaft	1960
Not shown	842.0	NW	327354 343665	Clay Shafts	1949
Not shown	844.0	NW	327474 343820	Unspecified Old Shafts	1960
Not shown	844.0	NW	327475 343822	Old Coal Shafts	1949
Not shown	844.0	NW	327475 343822	Unspecified Old Shafts	1898
Not shown	849.0	SW	327349 342761	Unspecified Disused Shaft	1974
Not shown	849.0	SW	327349 342761	Unspecified Disused Shaft	1985
Not shown	849.0	SW	327349 342761	Unspecified Disused Shaft	1994
Not shown	855.0	N	328317 344138	Unspecified Old Shaft	1898
Not shown	855.0	N	328317 344138	Old Coal Shaft	1949
Not shown	859.0	N	328322 344141	Unspecified Old Shaft	1960
Not shown	859.0	N	328118 344154	Unspecified Old Shaft	1898
Not shown	860.0	N	328117 344154	Old Coal Shaft	1949
Not shown	861.0	N	328120 344155	Unspecified Old Shaft	1960
Not shown	863.0	N	328317 344147	Unspecified Disused Shaft	1994
Not shown	863.0	N	328317 344147	Unspecified Disused Shaft	1985

ID	Distance (m)	Direction	NGR	Details	Date
Not shown	863.0	N	328317 344147	Unspecified Disused Shaft	1974
Not shown	880.0	S	328343 342141	Colliery	1898
Not shown	880.0	S	328343 342141	Disused Colliery	1949
Not shown	906.0	SW	327626 342403	Unspecified Old Shaft	1898
Not shown	935.0	NW	327363 343830	Unspecified Old Shaft	1960
Not shown	936.0	NW	327359 343828	Old Coal Shaft	1949
Not shown	939.0	SW	327264 342732	Unspecified Shaft	1873
Not shown	944.0	NW	327368 343851	Unspecified Old Shafts	1898
Not shown	955.0	E	329346 343325	Colliery	1873
Not shown	969.0	E	329411 343417	Colliery	1949
Not shown	977.0	S	328366 342196	Unspecified Shaft	1898
Not shown	977.0	NW	327385 343919	Unspecified Old Shafts	1898
Not shown	977.0	NW	327385 343919	Old Coal Shaft	1949
Not shown	978.0	E	329413 343360	Unspecified Disused Mine	1960
Not shown	983.0	NW	327382 343924	Unspecified Old Shaft	1960
Not shown	984.0	NW	327378 343922	Unspecified Disused Shaft	1994
Not shown	984.0	NW	327378 343922	Unspecified Disused Shaft	1985
Not shown	984.0	NW	327378 343922	Unspecified Disused Shaft	1974

5.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary? Yes

The following Coal Mining information provided by the Coal Authority is not represented on Mapping:

Distance (m)	Direction	Details
0.0	On Site	The site lies in or in proximity to the coal mining reporting area as defined by the Coal Authority

5.3 Johnson Poole and Bloomer

This dataset provides information as to whether the study site lies within an area where JPB hold information relating to mining.

Are there any JPB Mining areas within 1000m of the study site boundary? No

The following information provided by JPB is not represented on mapping: Database searched and no data found.

5.4 Non-Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary? Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not available	Iron Ore (Bedded)	Localised small scale underground mining may have occurred. Potential for difficult ground conditions are unlikely or localised and are at a level where they need not be considered

5.5 Non-Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.6 Natural Cavities

This dataset provides information based on the Peter Brett Associates natural cavities database. The dataset is made up of points and polygons. Where polygons are used these represent an area in which it is expected the cavities could be found. It does not indicate that cavities are present everywhere within the polygon, and caution should be used in the interpretation of this data.

Are there any Natural Cavities within 1000m of the study site boundary? No

Database searched and no data found.

5.7 Brine Extraction

This data provides information from the Cheshire Brine Subsidence Compensation Board.

Are there any Brine Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.8 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary? No

Database searched and no data found.

5.9 Cornwall and Devon Metalliferous Mining

This dataset provides information on metalliferous mining areas in Cornwall/Devon and is derived from records held by Mining Searches UK.

Are there any Cornwall and Devon Metalliferous Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

5.10 Clay Mining

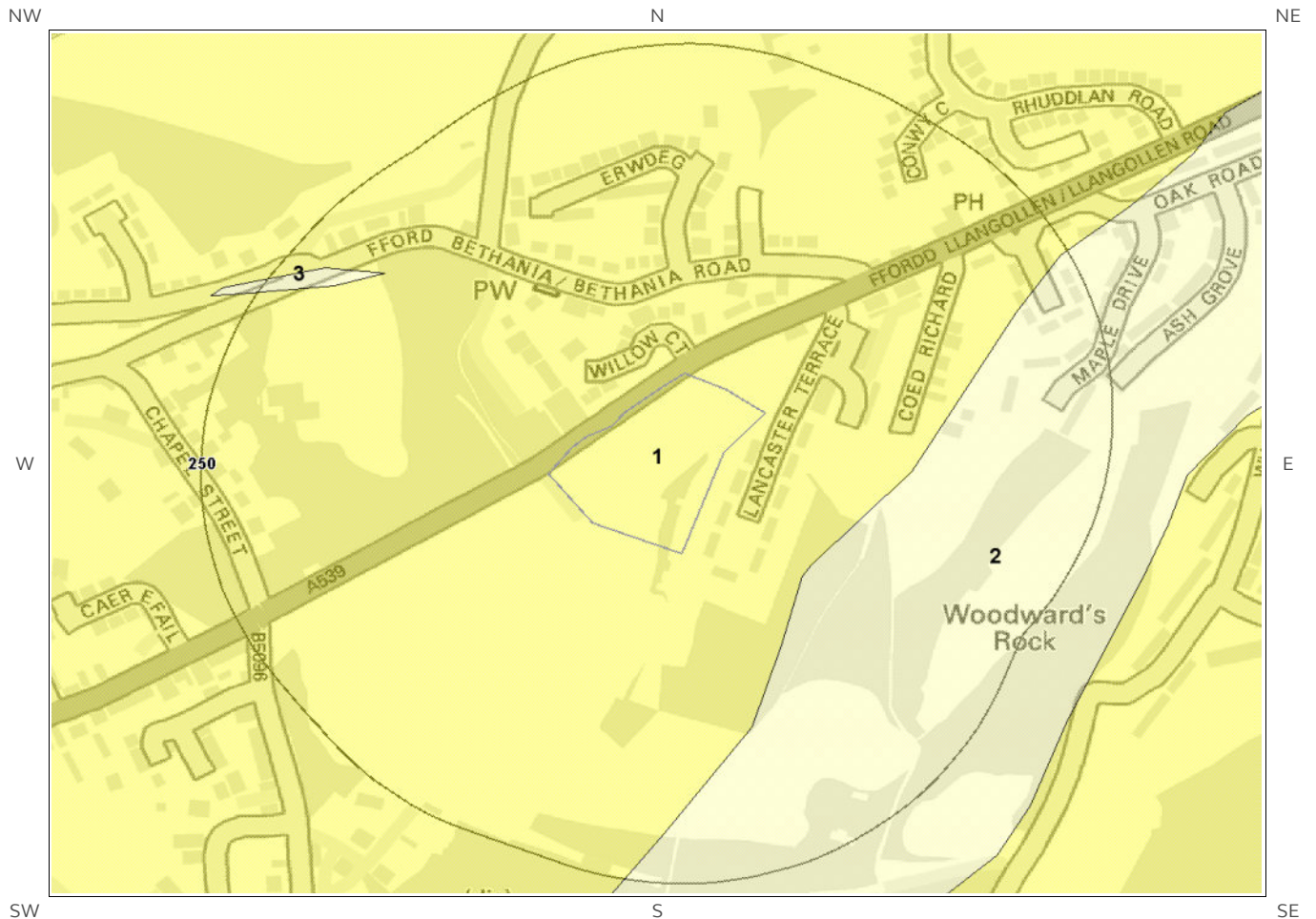
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

Are there any Clay Mining areas within 1000m of the study site boundary? No

Database searched and no data found.

6 Natural Ground Subsidence

6.1 Shrink-Swell Clay map

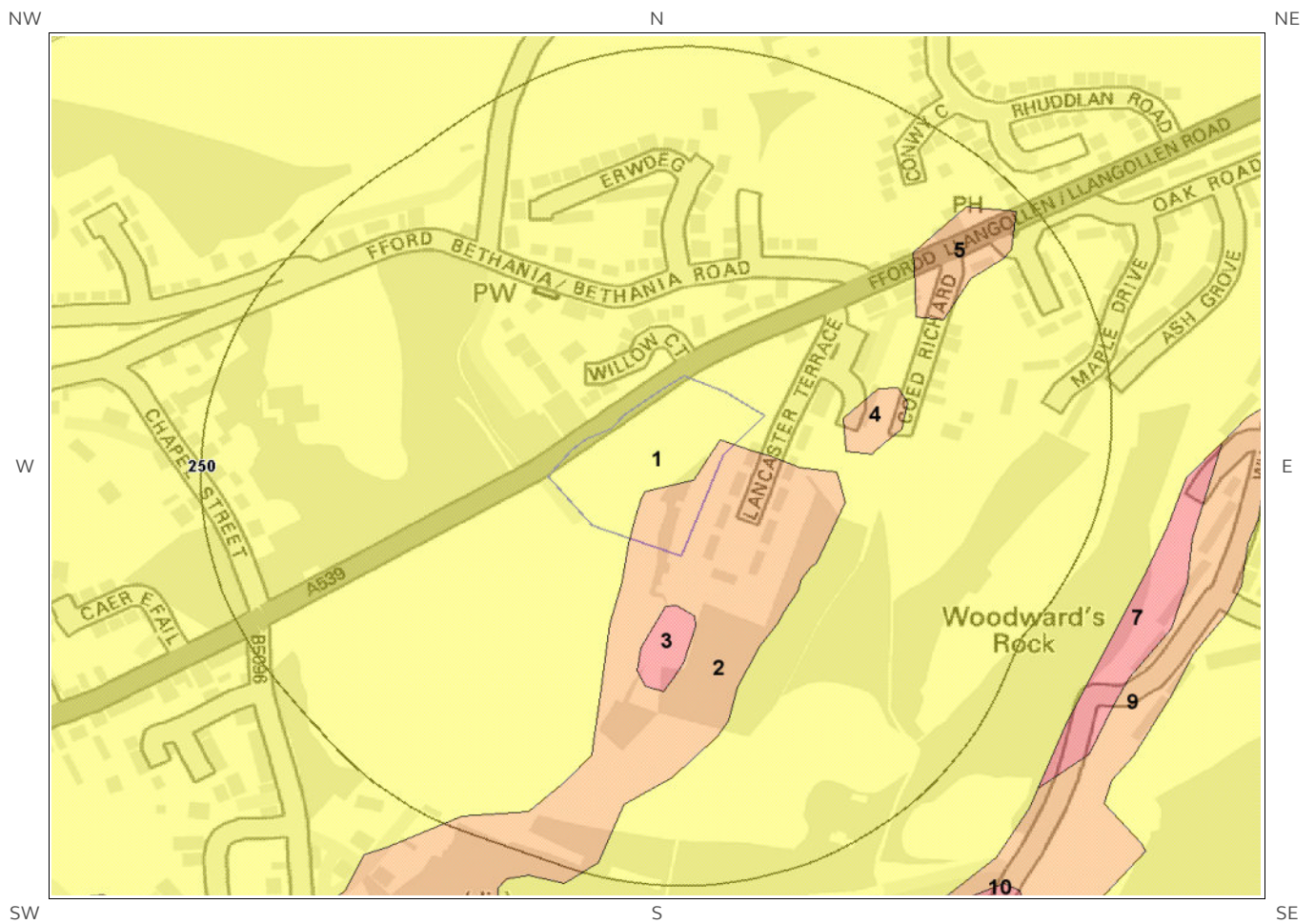


Shrink Swell Clay Legend

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6.2 Landslides map

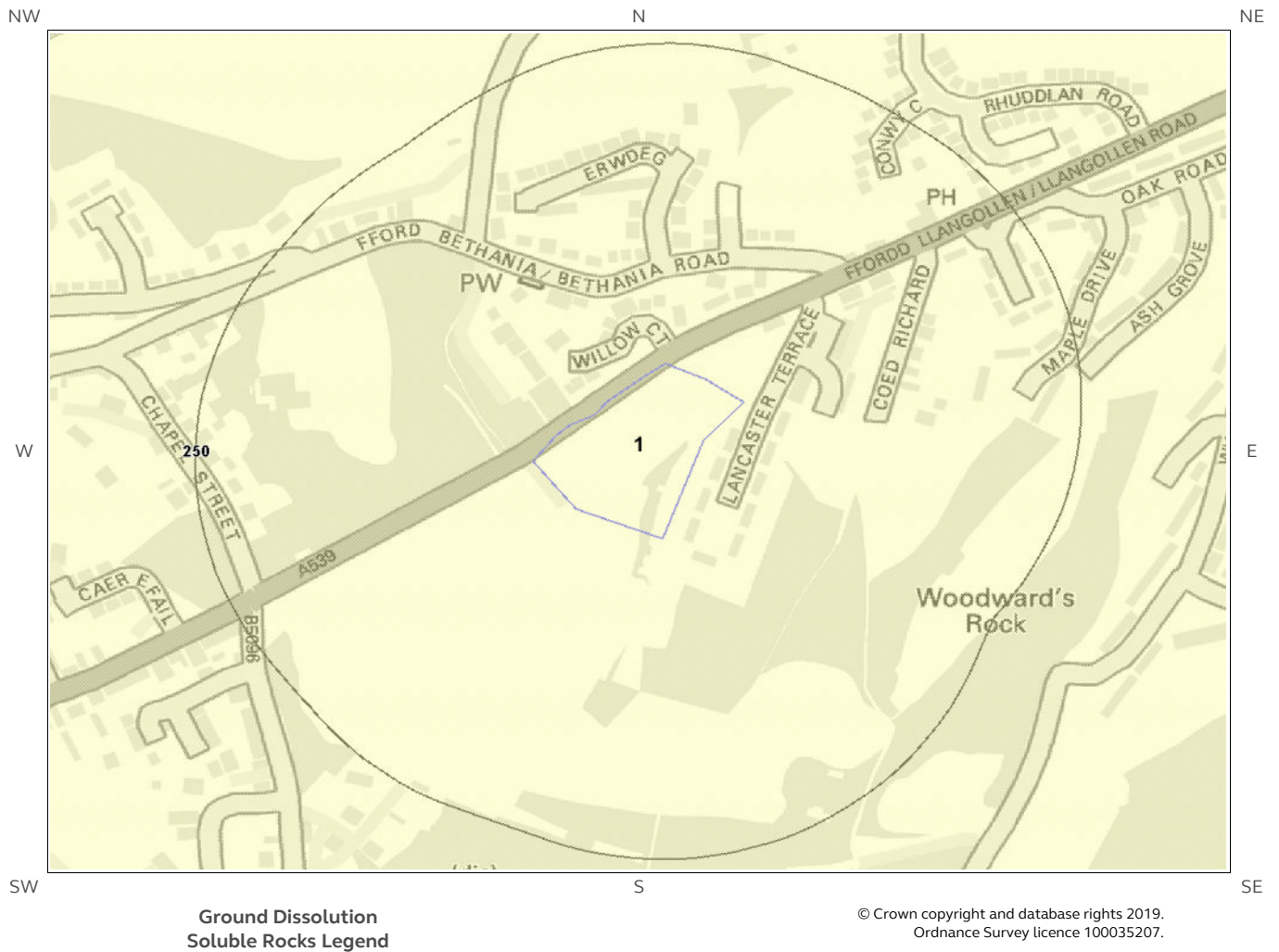


Landslides Legend

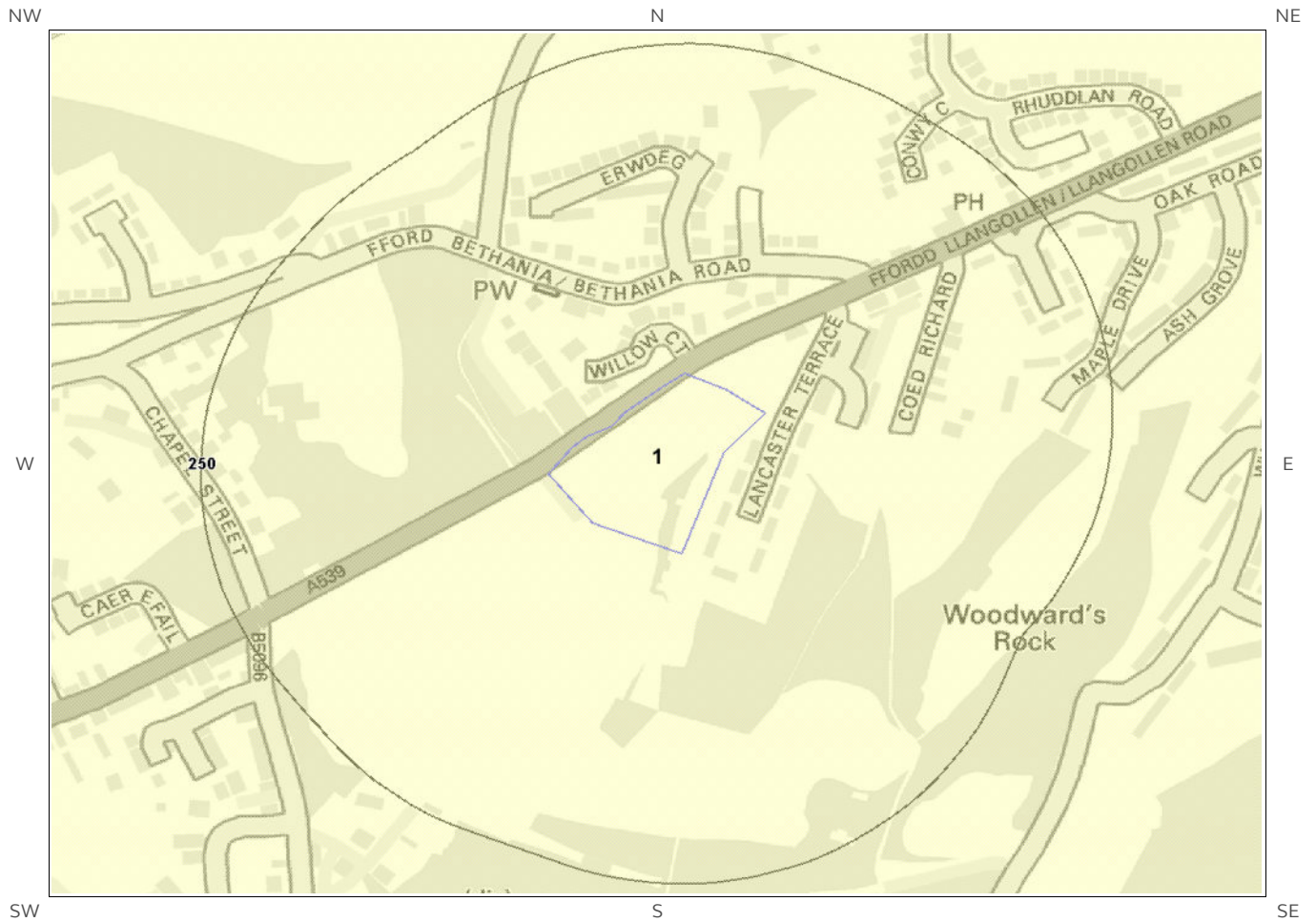
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6.3 Ground Dissolution of Soluble Rocks map



6.4 Compressible Deposits map

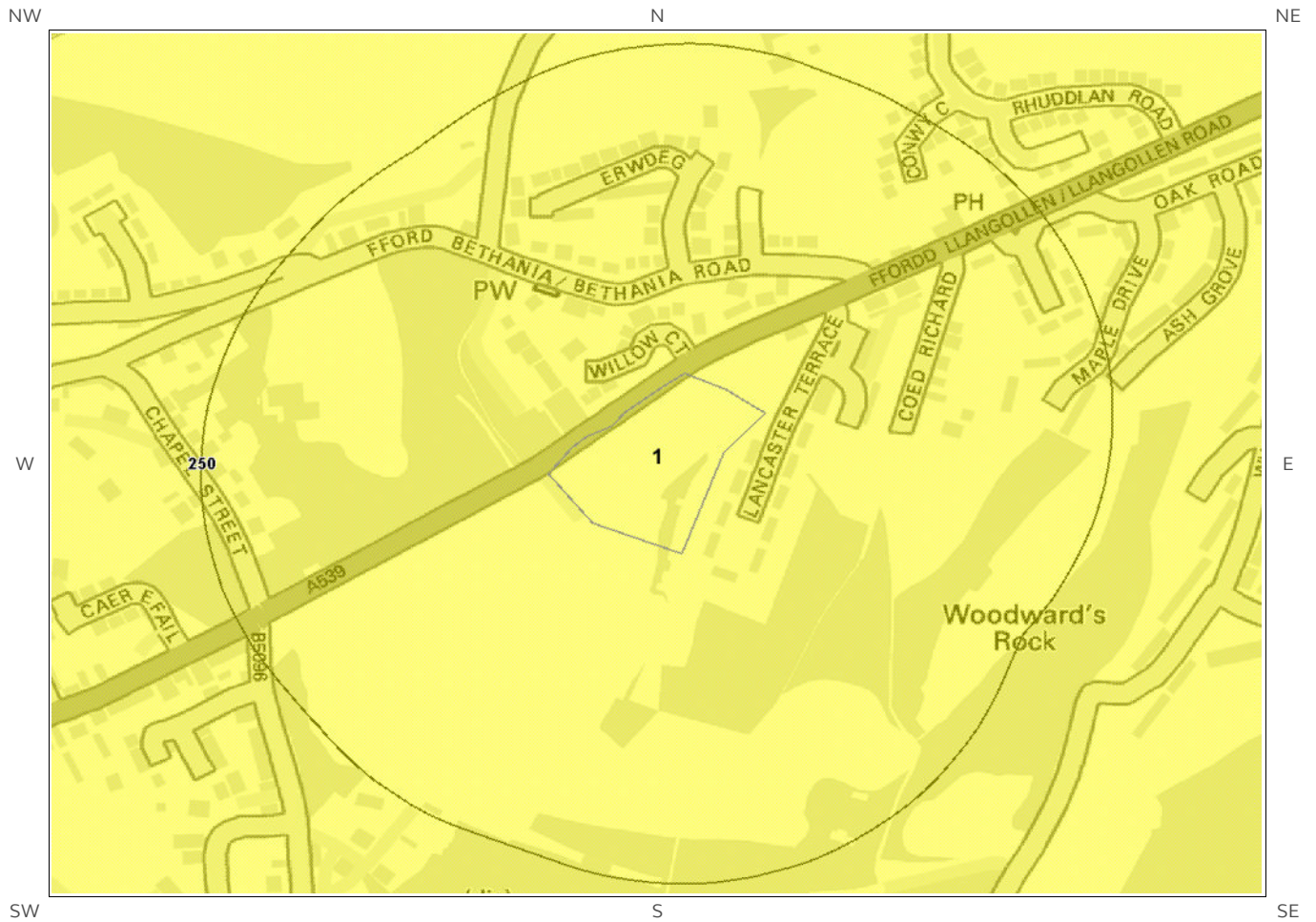


Compressible Deposits Legend

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6.5 Collapsible Deposits map

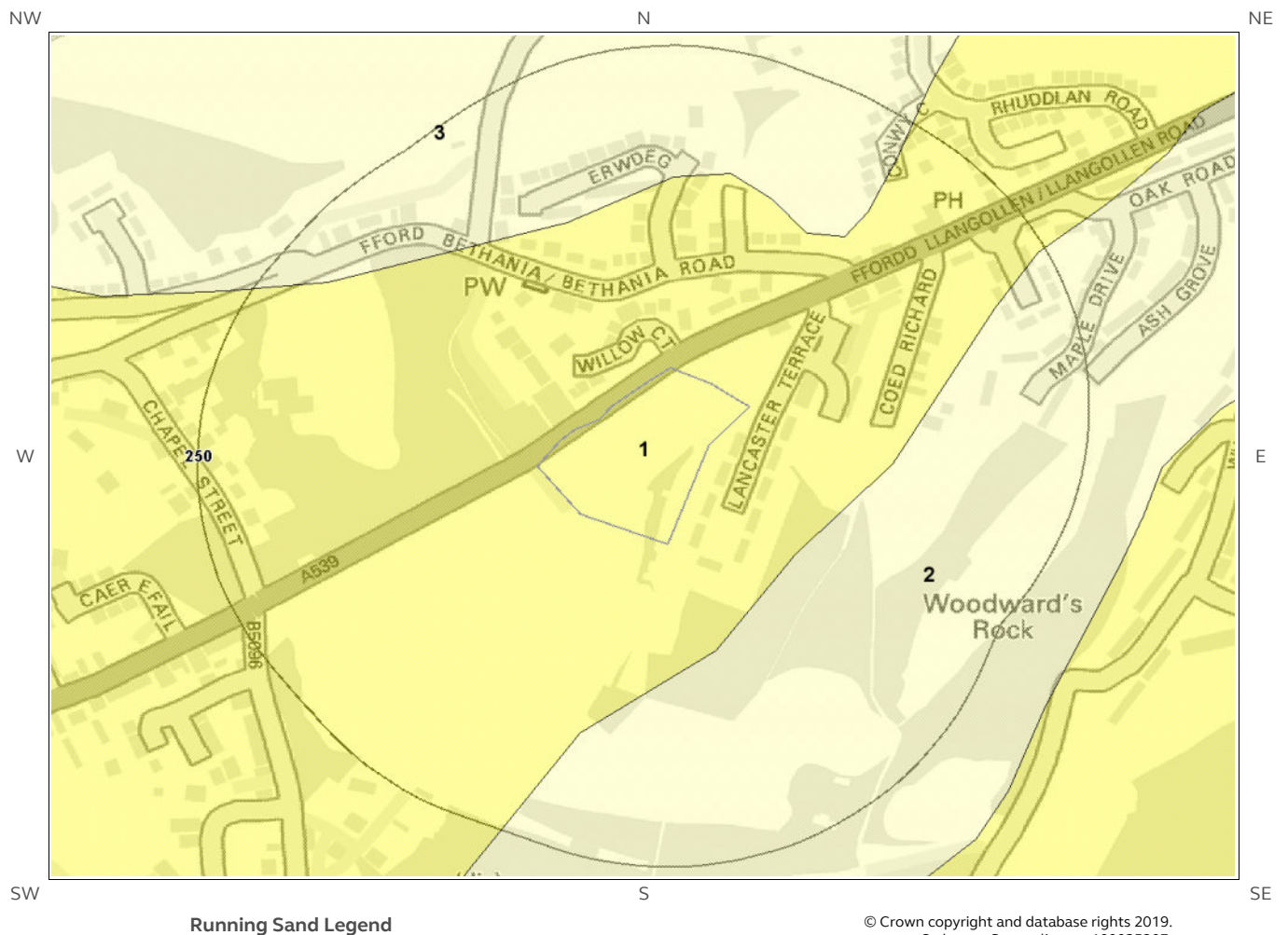


Collapsible Deposits Legend

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6.6 Running Sand map



6 Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS).

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site** boundary? Moderate

6.1 Shrink-Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

6.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
2	0.0	On Site	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property - no significant increase in insurance risk due to natural slope instability problems.

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

ID	Distance (m)	Direction	Hazard Rating	Details
3	38.0	S	Moderate	Significant potential for slope instability with relatively small changes in ground conditions. Avoid large amounts of water entering the ground through pipe leakage or soak-aways. Do not undercut or place large amounts of material on slopes without technical advice. For new build - consider the potential and consequences of ground movement during excavations, or consequence of changes to loading or drainage. For existing property - probable increase in insurance risk is likely due to potential natural slope instability after changes to ground conditions such as a very long, excessively wet winter.

6.3 Ground Dissolution of Soluble Rocks

The following Ground Dissolution information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

6.4 Compressible Deposits

The following Compressible Deposits information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

6.5 Collapsible Deposits

The following Collapsible Rocks information provided by the British Geological Survey:

ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

6.6 Running Sands

The following Running Sands information provided by the British Geological Survey:

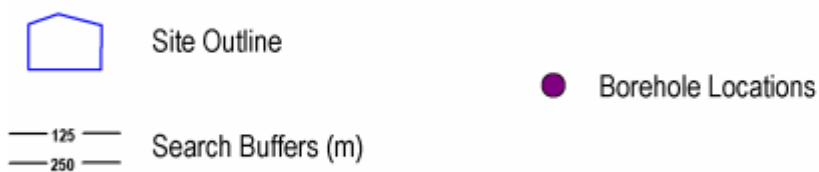
ID	Distance (m)	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

7 Borehole Records map



Borehole Records Legend

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7 Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of boreholes within 250m of the study site boundary:

15

ID	Distance (m)	Direction	NGR	BGS Reference	Drilled Length	Borehole Name
1	165.0	W	327910 343250	SJ24SE632	No details	ACREFAIR WORKS SOCIAL CLUB 2
2A	172.0	W	327900 343200	SJ24SE488	No details	AIR PRODUCTS SOCIAL CLUB 11
3A	172.0	W	327900 343200	SJ24SE489	No details	AIR PRODUCTS SOCIAL CLUB 12
4A	172.0	W	327900 343200	SJ24SE486	No details	AIR PRODUCTS SOCIAL CLUB 9
5A	172.0	W	327900 343200	SJ24SE487	No details	AIR PRODUCTS SOCIAL CLUB 10
6A	172.0	W	327900 343200	SJ24SE483	No details	AIR PRODUCTS SOCIAL CLUB 6
7A	172.0	W	327900 343200	SJ24SE485	No details	AIR PRODUCTS SOCIAL CLUB 8
8A	172.0	W	327900 343200	SJ24SE484	No details	AIR PRODUCTS SOCIAL CLUB 7
9A	172.0	W	327900 343200	SJ24SE480	No details	AIR PRODUCTS SOCIAL CLUB 3
10A	172.0	W	327900 343200	SJ24SE479	No details	AIR PRODUCTS SOCIAL CLUB 2
11A	172.0	W	327900 343200	SJ24SE481	No details	AIR PRODUCTS SOCIAL CLUB 4
12A	172.0	W	327900 343200	SJ24SE482	No details	AIR PRODUCTS SOCIAL CLUB 5
13A	172.0	W	327900 343200	SJ24SE478	No details	AIR PRODUCTS SOCIAL CLUB 1
14	179.0	W	327900 343270	SJ24SE633	No details	ACREFAIR WORKS SOCIAL CLUB 3
15	193.0	W	327880 343240	SJ24SE631	No details	ACREFAIR WORKS SOCIAL CLUB 1

The borehole records are available using the hyperlinks below: Please note that if the donor of the borehole record has requested the information be held as commercial-in-confidence, the additional data will be held separately by the BGS and a formal request must be made for its release.

8 Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

2

For further information on how this data is calculated and limitations upon its use, please see the Groundsure Geo Insight User Guide, available on request.

Distance (m)	Direction	Sample Type	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	RuralSoil	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg
46.0	SE	RuralSoil	<15 mg/kg	<1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	<100 mg/kg

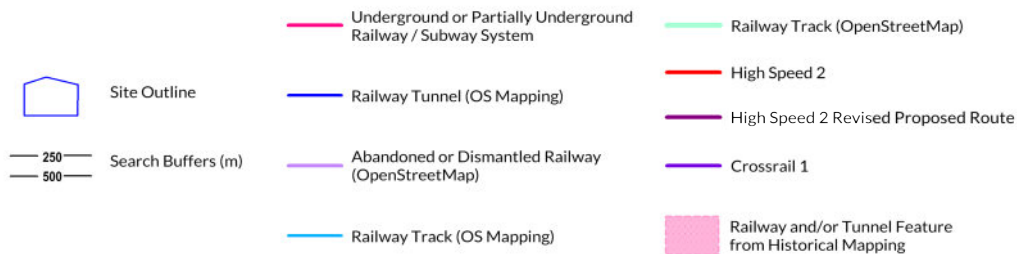
*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to the search radius.

9 Railways and Tunnels map



Railways and Tunnels Legend

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9 Railways and Tunnels

9.1 Tunnels

This data is derived from OpenStreetMap and provides information on the possible locations of underground railway systems in the UK - the London Underground, the Tyne & Wear Metro and the Glasgow Subway.

Have any underground railway lines been identified within the study site boundary? No

Have any underground railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

This data is derived from Ordnance Survey mapping and provides information on the possible locations of railway tunnels forming part of the UK overground railway network.

Have any other railway tunnels been identified within the site boundary? No

Have any other railway tunnels been identified within 250m of the site boundary? No

Database searched and no data found.

Any records that have been identified are represented on the Railways and Tunnels map.

9.2 Historical Railway and Tunnel Features

This data is derived from Groundsure's unique Historical Land-use Database and contains features relating to tunnels, railway tracks or associated works that have been identified from historical Ordnance Survey mapping.

Have any historical railway or tunnel features been identified within the study site boundary? Yes

Have any historical railway or tunnel features been identified within 250m of the study site boundary? Yes

ID	Distance (m)	Direction	NGR	Details	Date
1	0	On Site	328258 343203	Railway Sidings	1873
2	0	On Site	328017 343458	Railway Sidings	1898
3	0	On Site	328003 343086	Railway Sidings	1938
4	0	On Site	328041 343194	Railway Sidings	1949
5	0	On Site	328049 343178	Railway Sidings	1910
6	0	On Site	328011 343260	Railway Sidings	1873

ID	Distance (m)	Direction	NGR	Details	Date
21	0	On Site	328239 343201	Railway Sidings	1873
22	0	On Site	327863 343285	Railway Sidings	1873
23	0	On Site	328243 343578	Railway Sidings	1899
24	0	On Site	328111 343204	Railway Sidings	1912
25	14	SW	328050 343177	Railway Sidings	1961
7	15	W	327982 343162	Railway Sidings	1960
26	40	SW	328036 343119	Railway Sidings	1873
27	77	SW	327956 343143	Railway Sidings	1912
8	123	NE	328070 343510	Railway Sidings	1949
9	124	NE	328331 343690	Railway Sidings	1910
10	125	NE	328285 343506	Railway Sidings	1938
11A	206	SW	328025 342962	Railway Sidings	1960
12	208	SW	328003 342972	Railway Sidings	1898
28	214	SW	327915 343060	Railway Sidings	1873
13A	215	SW	328016 342961	Railway Sidings	1949
14	224	N	327957 343708	Tramway Sidings	1938
15C	226	SW	327918 342981	Railway Sidings	1949
29A	228	SW	328021 342959	Railway Sidings	1899
30A	228	SW	328021 342959	Railway Sidings	1912
31	229	SW	327973 342984	Railway Sidings	1961
32	230	SW	328029 342949	Railway Sidings	1873
16	232	SW	328015 342961	Railway Sidings	1910
17B	232	SW	327812 343155	Railway Sidings	1938
33	232	N	327993 343531	Railway Sidings	1912
18B	238	SW	327809 343159	Railway Sidings	1949
19C	238	SW	327917 342974	Railway Sidings	1960
34	239	SW	327991 342963	Railway Sidings	1961
35C	240	SW	327918 342975	Railway Sidings	1961
36C	241	SW	327918 342974	Railway Sidings	1912

ID	Distance (m)	Direction	NGR	Details	Date
37C	243	SW	327917 342972	Railway Sidings	1873
38C	243	SW	327917 342972	Railway Sidings	1899
20	246	SW	327802 343163	Railway Sidings	1960
39B	248	W	327804 343161	Railway Sidings	1960

Any records that have been identified are represented on the Railways and Tunnels map.

9.3 Historical Railways

This data is derived from OpenStreetMap and provides information on the possible alignments of abandoned or dismantled railway lines in proximity to the study site.

Have any historical railway lines been identified within the study site boundary? No

Have any historical railway lines been identified within 250m of the study site boundary? Yes

Distance (m)	Direction	Status
33	W	Abandoned
33	W	Razed
216	SW	Dismantled
216	SW	Razed
216	SW	Abandoned
216	SW	Razed
219	SW	Razed
219	SW	Abandoned
232	SW	Razed
232	SW	Dismantled

Multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels map.

9.4 Active Railways

These datasets are derived from Ordnance Survey mapping and OpenStreetMap and provide information on the possible locations of active railway lines in proximity to the study site.

Have any active railway lines been identified within the study site boundary? No

Have any active railway lines been identified within 250m of the study site boundary? No

Database searched and no data found.

Multiple sections of the same track may be listed in the detail above

Any records that have been identified are represented on the Railways and Tunnels map.

9.5 Railway Projects

These datasets provide information on the location of large scale railway projects High Speed 2 and Crossrail 1 .

Is the study site within 5km of the route of the High Speed 2 rail project? No

Is the study site within 500m of the route of the Crossrail 1 rail project? No

*Further information on proximity to these routes, the project construction status and associated works can be obtained through the purchase of a **Groundsure HS2 and Crossrail 1 Report**.*

The route data has been digitised from publicly available maps by Groundsure. The route as provided relates to the Crossrail 1 project only, and does not include any details of the Crossrail 2 project, as final details of the route for Crossrail 2 are still under consultation.

Please note that this assessment takes account of both the original Phase 2b proposed route and the amended route proposed in 2016. As the Phase 2b route is still under consultation, Groundsure are providing information on both options until the final route is formally confirmed. Practitioners should take account of this uncertainty when advising clients.

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