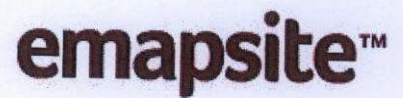


APPENDIX C

Environmental Database Search Information



EmapSite
Masdar House,
Eversley, RG27 0RP

Report Reference:	EMS- 139229_199276
Your Reference:	EMS_139229_199 276
Report Date	Sep 27, 2011
Report Delivery Method:	Email - pdf

GroundSure GeoInsight

Address: wrexham

Dear Sir/Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure GeoInsight** as requested.

If you would like further assistance regarding this report then please contact the emapsite customer services team on 0118 9736883 quoting the above report reference number.

Yours faithfully,

emapsite customer services team

Enc.
GroundSure GeoInsight

emapsite™

Aerial Photograph of Study Site



Site Name: wrexham
Grid Reference: 339232,350747
Size of Site: 21.66 ha

Aerial photography supplied by Getmapping PLC.
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Overview of Findings

The GroundSure GeoInsight 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 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow 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.

Report Section	Number of records found within (X) m of the study site boundary
1. Geology	Description
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site?*	No
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground/Drift Geology present beneath the study site?*	Yes
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	Yes
1.2.3 Are there any records of landslip within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
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 relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.3.4 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 not in a Radon Affected Area, as less than 1% of properties are above the Action Level
1.3.5 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

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

Source:Scale 1:50,000 BGS Sheet No:122

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	13	1	42	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	0	0

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	1	0	0	0	0
3.3 Johnson Poole and Bloomer Mining Area	0	0	0	0	0
3.4 Non-Coal Mining*	0	0	0	0	0
3.5 Non-Coal Mining Cavities	0	0	0	0	0
3.6 Natural Cavities	0	0	0	0	0
3.7 Brine Extraction	0	0	0	0	0
3.8 Gypsum Extraction	0	0	0	0	0
3.9 Tin Mining	0	0	0	0	0
3.10 Clay Mining	0	0	0	0	0

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

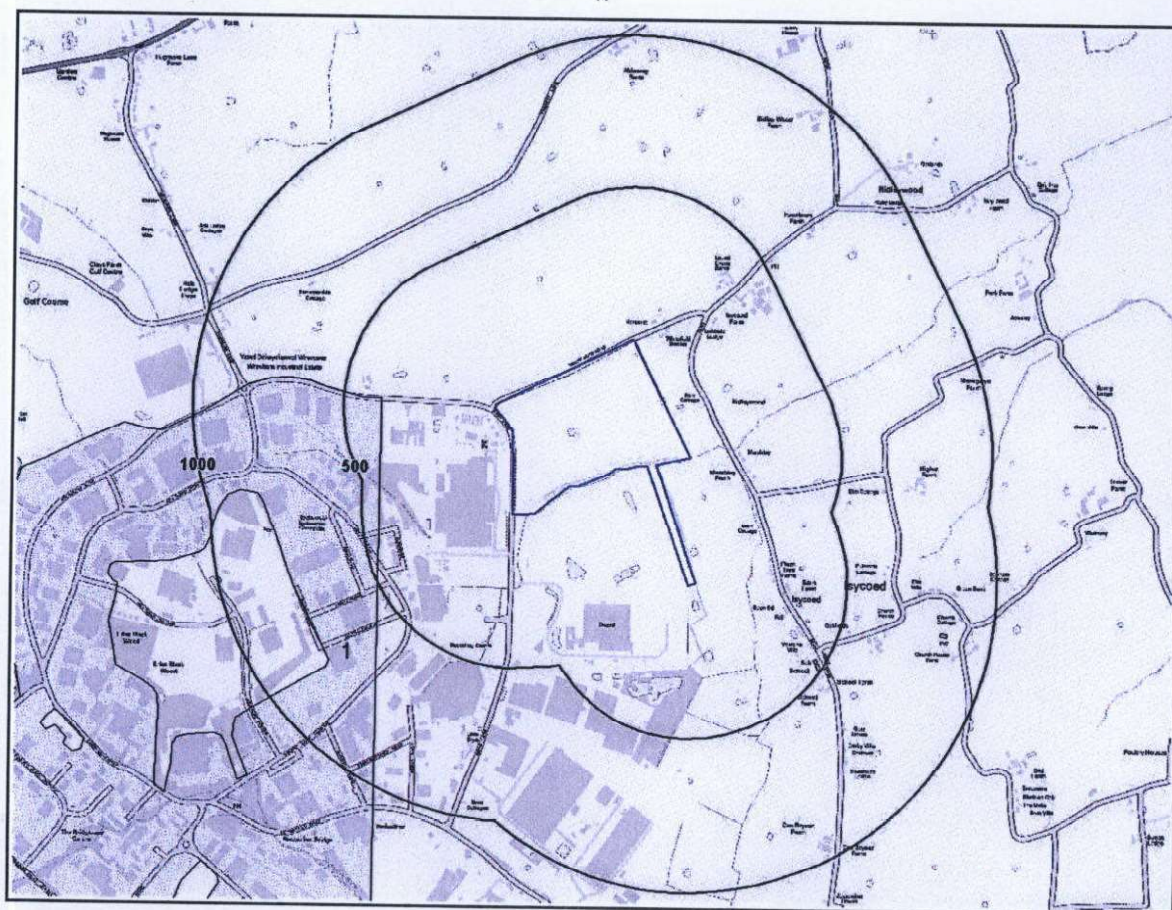
4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Very Low	-	-	-	-
4.2 Landslides	Very Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Negligible	-	-	-	-
4.4 Compressible Deposits	Negligible	-	-	-	-
4.5 Collapsible Deposits	Very Low	-	-	-	-
4.6 Running Sand	Very Low	-	-	-	-

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

5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	1	2	16	-	-

6. Estimated Background Soil Chemistry	on-site	0-50	51-250	251-500	501-1000
6.1 Records of Background Soil Chemistry	4	0	0	-	-

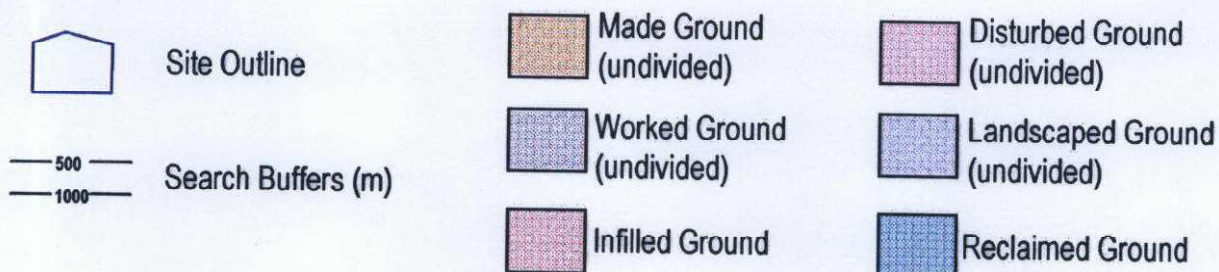
1.1 Artificial Ground Map



Artificial Ground Legend



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

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:122

1.1.1 Artificial/Made Ground

Are there any records of Artificial/Made Ground within 500m of the study site boundary? **Yes**

ID	Distance (m)	Direction	LEX Code	Description	Rock Description
1	376.0	W	LSGR-UNKN	LANDSCAPED GROUND (UNDIVIDED)	UNKNOWN/UNCLASSIFIED ENTRY

1.1.2 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.

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

This map illustrates the Fukushima Daiichi Nuclear Power Plant site and its immediate surroundings. The plant itself is located in the center-right of the map, with its containment domes clearly visible. A large, irregularly shaped area is outlined in black, representing the 500m exclusion zone, with the number '500' printed within it. The map shows various roads, including National Route 4 and Route 116, and several rivers such as the Arakawa River and Tone River. Other labeled locations include Fukushima City, Maebashi, and various local districts like Aomori and Maebashi. The map also indicates the presence of other nuclear power plants in the region, such as the Fukushima Second Nuclear Power Plant and the Fukushima Third Nuclear Power Plant. The map is oriented with North (N) at the top and South (S) at the bottom.

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— 500 —
— 1000 —

Search Buffers (m)

Report Reference: EMS-139229_199276

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/Drift Geology

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

ID	Distance (m)	Direction	Lex Code	Description	Rock Description
1	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
2	376.0	W	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON

1.2.2 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

1.2.3 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, 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.

1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary?

No

Database searched and no data found.

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

Enabled by  Ordnance Survey

— 500 —
— 1000 —

Search Buffers (m)

Report Reference: EMS-139229_199276

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:122

1.3.1 Bedrock/Solid Geology

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

ID	Distance (m)	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	SAL-MDSC	Salop Formation - Mudstone, Sandstone And Conglomerate	/ Westphalian D
2	0.0	On Site	KNSF-SDST	Kinnerton Sandstone Formation - Sandstone	Scythian
3	376.0	W	SAL-MDSC	Salop Formation - Mudstone, Sandstone And Conglomerate	/ Westphalian D
4	416.0	NW	KNSF-SDST	Kinnerton Sandstone Formation - Sandstone	Scythian
5	426.0	N	KNSF-SDST	Kinnerton Sandstone Formation - Sandstone	Scythian
6	440.0	NW	KNSF-SDST	Kinnerton Sandstone Formation - Sandstone	Scythian

1.3.2 Permeability of Bedrock Ground

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

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Moderate	Low
0.0	On Site	Intergranular	High	High

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary? **Yes**

ID	Distance (m)	Direction	Category Description	Feature Description
8	416.0	NW	FAULT	Normal fault, inferred
9	426.0	N	FAULT	Normal fault, inferred
10	440.0	NW	FAULT	Normal fault, inferred

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 nationwide coverage.

1.3.4 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 not in a Radon Affected Area, as less than 1% of properties are above the Action Level

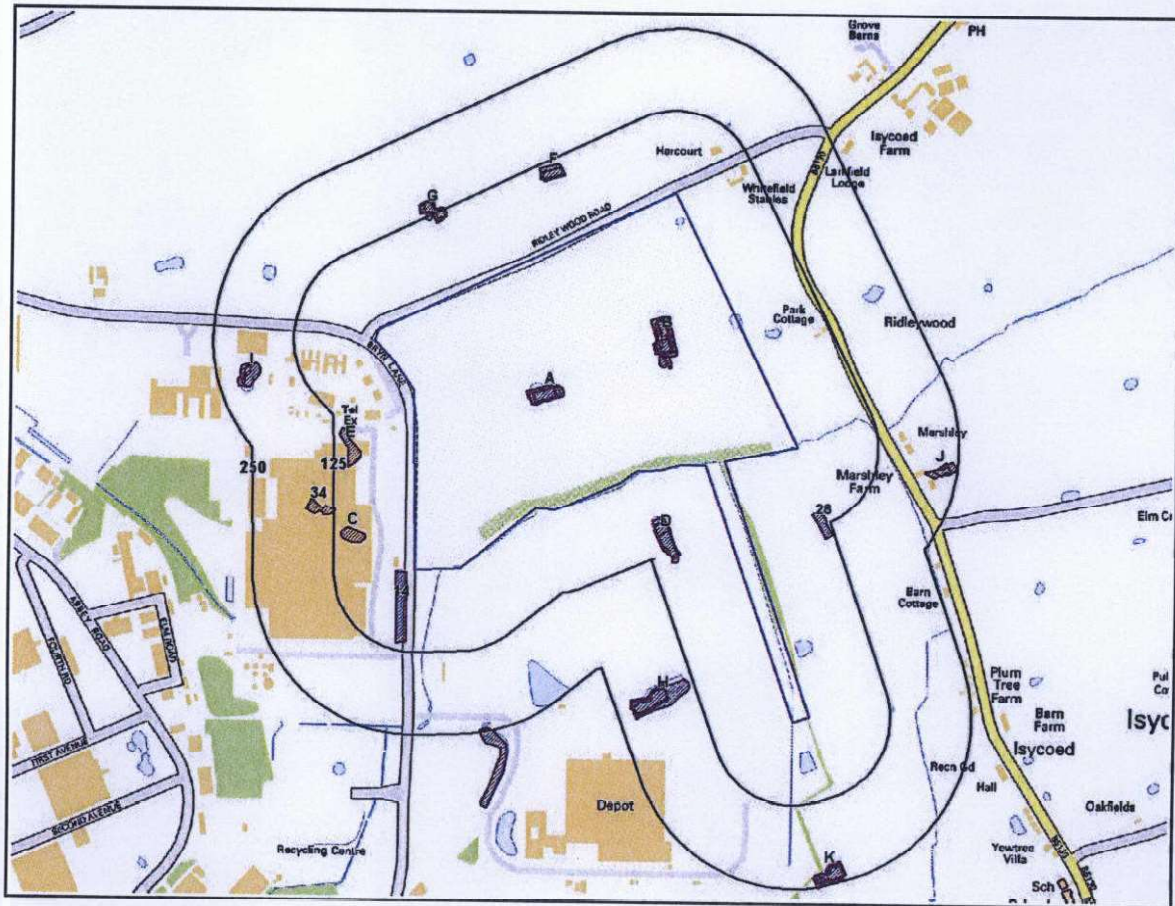
* This includes an automatically generated 50m buffer zone around the site.

1.3.5 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?

No radon protective measures are necessary

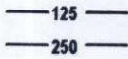
2. Ground Workings Map



Ground Workings Legend

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

2. Ground Workings

2.1 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

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	0.0	On Site	339178,350745	Ponds	1960
2A	0.0	On Site	339178,350745	Ponds	1992
3B	0.0	On Site	339357,350834	Ponds	1982
4A	0.0	On Site	339178,350745	Ponds	1982
5B	0.0	On Site	339357,350834	Ponds	1960
6B	0.0	On Site	339357,350834	Ponds	1968
7A	0.0	On Site	339178,350745	Ponds	1968
8B	0.0	On Site	339348,350825	Ponds	1900
9A	0.0	On Site	339165,350745	Ponds	1900
10B	0.0	On Site	339353,350832	Pond	1949
11A	0.0	On Site	339169,350743	Ponds	1949
12A	0.0	On Site	339174,350743	Ponds	1872
13B	0.0	On Site	339357,350823	Ponds	1872
14	12.0	W	338953,350418	Pond	1992
15D	71.0	S	339360,350527	Ponds	1872
16C	76.0	W	338878,350527	Pond	1960
17C	76.0	W	338878,350527	Pond	1968
18D	78.0	S	339359,350522	Pond	1992
19E	83.0	W	338872,350660	Ponds	1960
20E	83.0	W	338872,350660	Ponds	1968
21D	83.0	W	339363,350519	Pond	1982
22D	83.0	W	339363,350519	Pond	1960
23D	83.0	W	339363,350519	Pond	1968
24F	95.0	NW	339181,351079	Pond	1872
25F	96.0	NW	339177,351083	Pond	1982
26F	96.0	NW	339177,351083	Pond	1960
27F	96.0	NW	339177,351083	Pond	1968
28	102.0	E	339601,350548	Pond	1872
29G	110.0	NW	338994,351020	Pond	1949
30G	112.0	NW	338995,351022	Pond	1982
31G	112.0	NW	338995,351022	Pond	1960
32G	112.0	NW	338995,351022	Pond	1968
33G	113.0	NW	338999,351023	Ponds	1872
34	123.0	W	338826,350569	Ponds	1872

35 H	132.0	W	339354,350285	Pond	1992
36 H	169.0	W	339337,350284	Ponds	1949
37 H	169.0	W	339337,350284	Ponds	1898
38 H	169.0	W	339337,350278	Ponds	1982
39 H	169.0	W	339337,350278	Ponds	1960
40 H	169.0	W	339337,350278	Ponds	1968
41 H	171.0	W	339337,350277	Ponds	1872
42I	183.0	W	338717,350769	Pond	1992
43I	195.0	W	338706,350769	Pond	1949
44J	201.0	E	339779,350635	Pond	1900
45J	214.0	E	339790,350637	Pond	1913
46J	214.0	E	339790,350637	Pond	1897
47 K	221.0	S	339614,350024	Pond	1898
48 K	221.0	S	339614,350024	Pond	1949
49 K	223.0	S	339617,350024	Pond	1913
50 K	223.0	S	339617,350024	Pond	1897
51 K	224.0	S	339618,350022	Pond	1982
52 K	224.0	S	339618,350022	Pond	1960
53 K	224.0	S	339618,350022	Pond	1968
54 K	226.0	S	339617,350018	Pond	1872
55 L	245.0	S	339109,350176	Pond	1992
56 L	245.0	S	339109,350176	Pond	1982

2.2 Historical Underground Workings 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? **No**

Database searched and no data found.

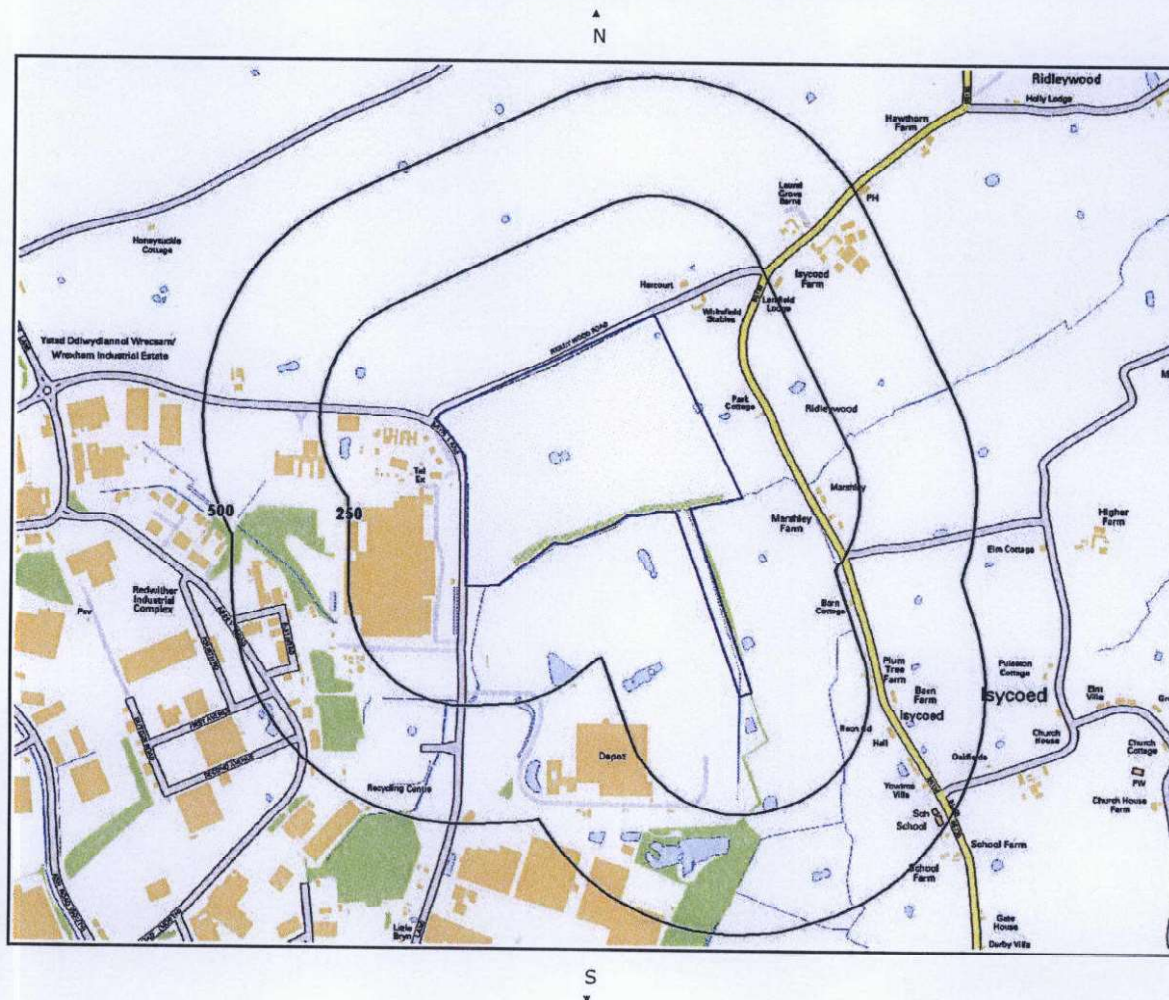
2.3 Current Ground Workings

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? **No**

Database searched and no data found.

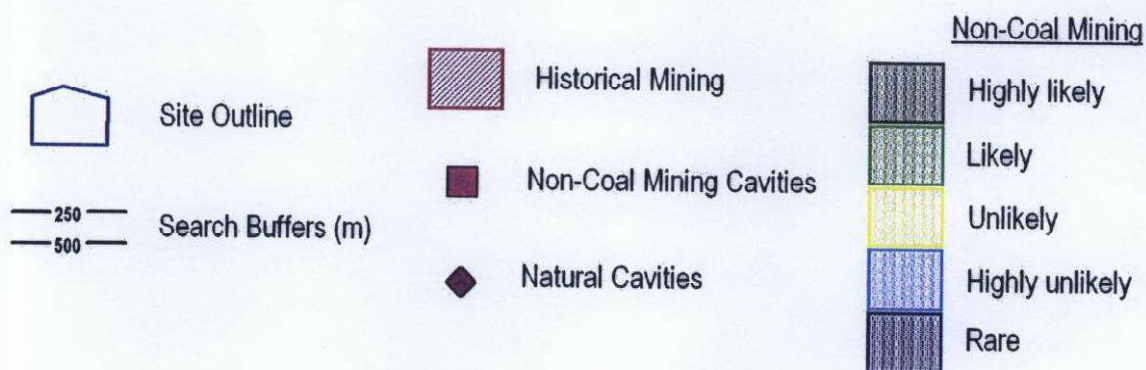
3. Mining, Extraction & Natural Cavities Map



Mining, Extraction & Natural Cavities
Legend

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3. Mining, Extraction & Natural Cavities

3.1 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?

No

Database searched and no data found.

3.2 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 study site is located within the specified search distance of an identified mining area. Further details concerning this can be obtained from the Coal Authority Helpline on 0845 762 6848.

3.3 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. No results found.

3.4 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?

No

Database searched and no data found.

3.5 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

Report Reference: EMS-139229_199276

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.

3.6 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary?

No

Database searched and no data found.

3.7 Brine Extraction

This dataset provides information from the Brine Compensation Board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.8 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.

3.9 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level. More detailed information on potential Tin Mining may be found in Section 3.4 – Non-Coal Mining Hazards.

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

No

Database searched and no data found.

3.10 Clay Mining

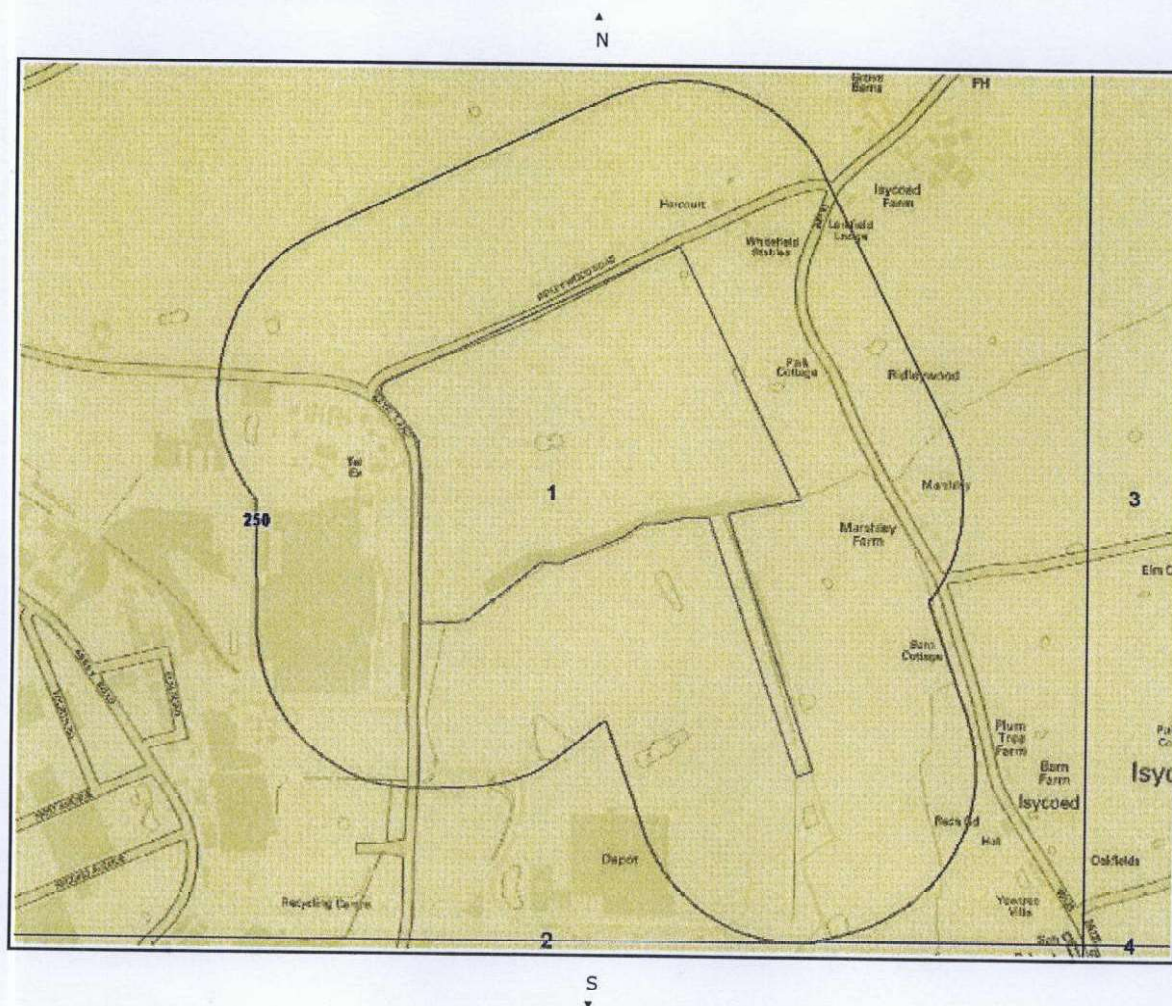
This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

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

No

Database searched and no data found.

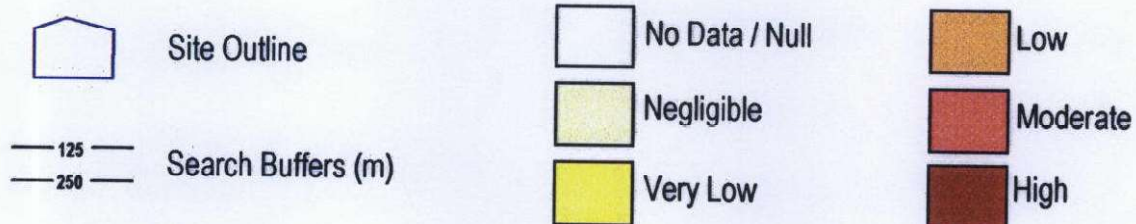
4.1 Shrink-Swell Clay Map



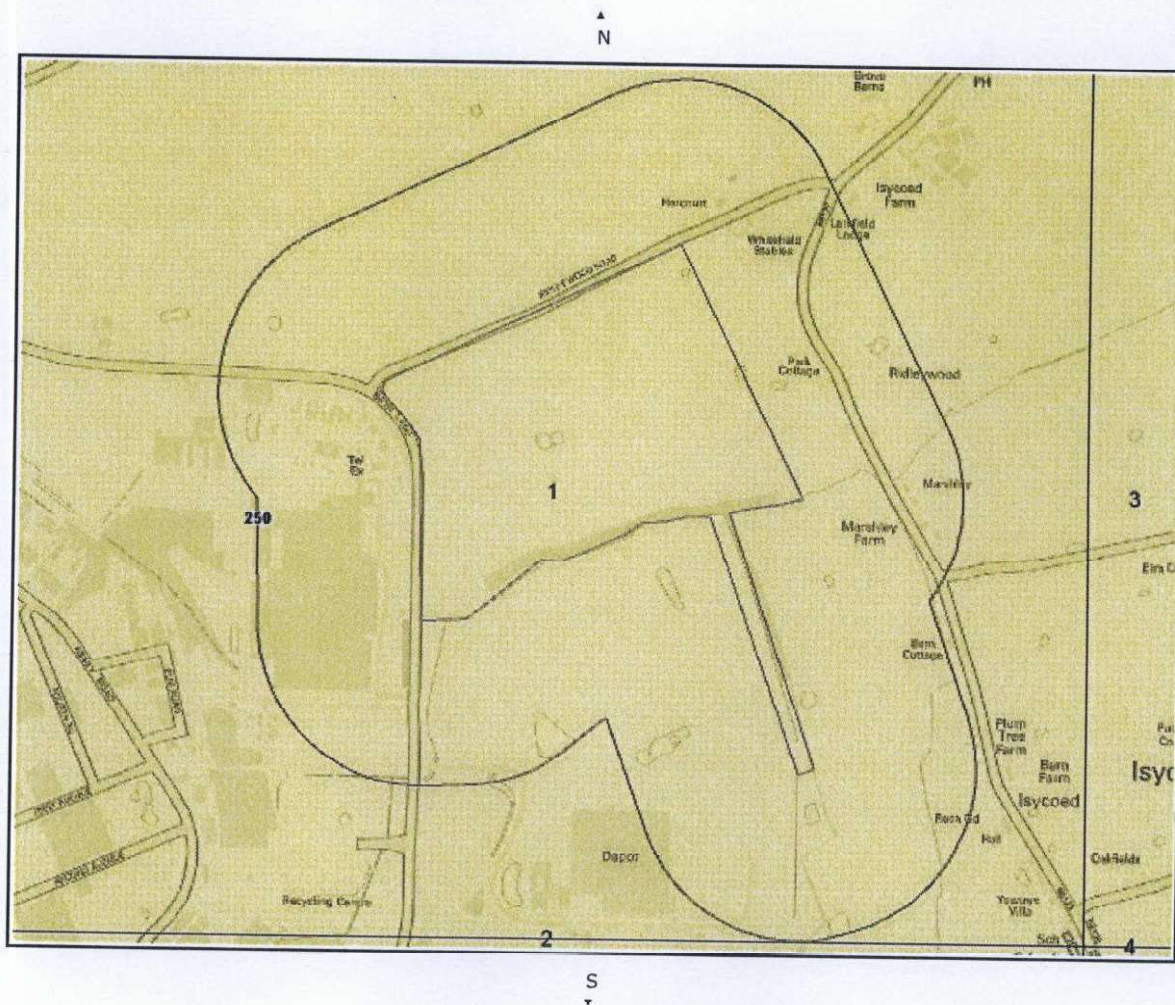
Shrink-Swell Clay Legend



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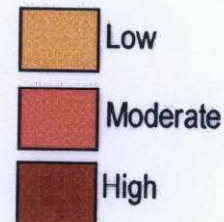
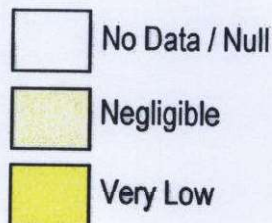
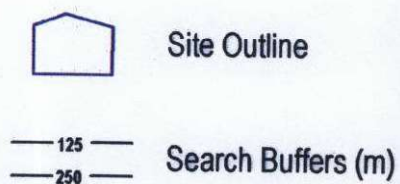
4.2 Landslides Map



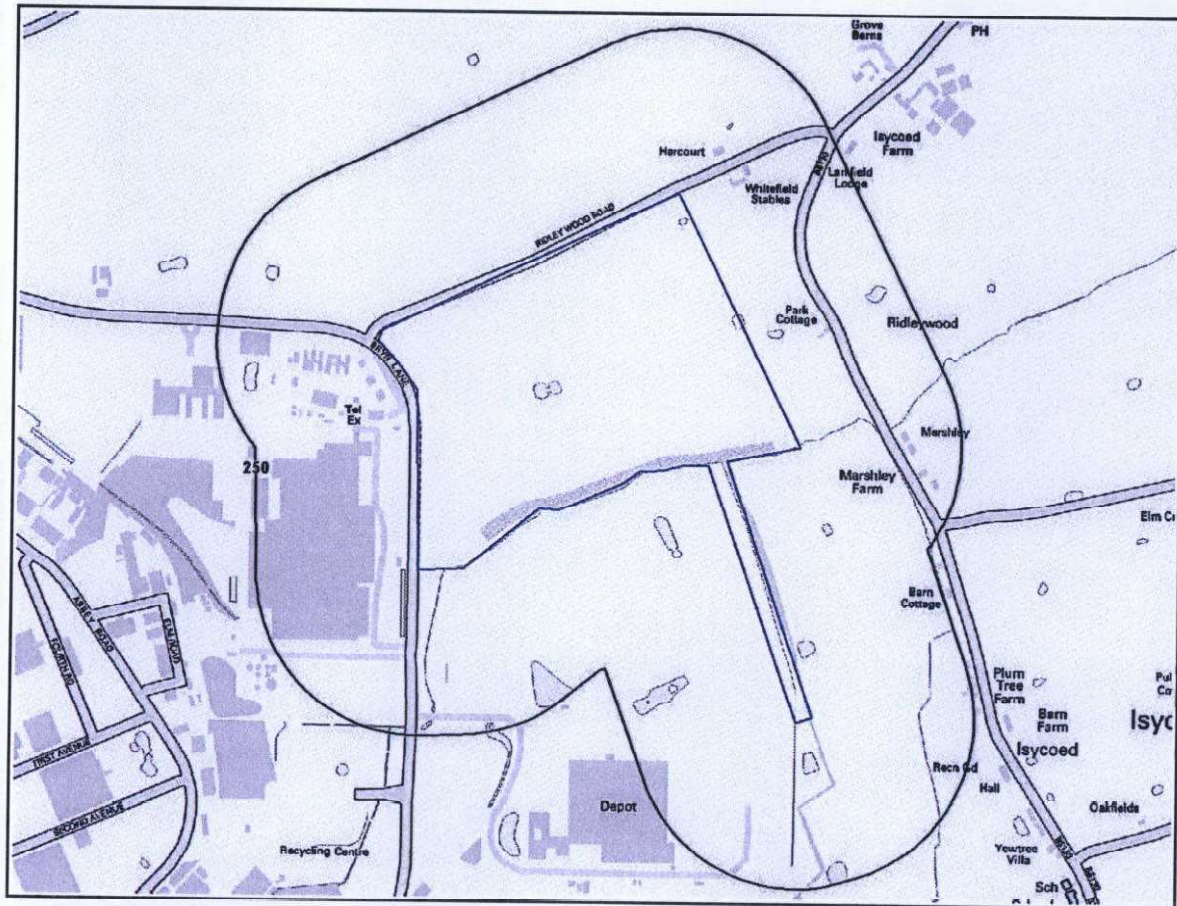
Landslides Legend

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4.3 Ground Dissolution Soluble Rocks Map

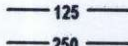


Ground Dissolution Soluble Rocks
Legend

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 Site Outline

 Search Buffers (m)

 No Data / Null

 Negligible

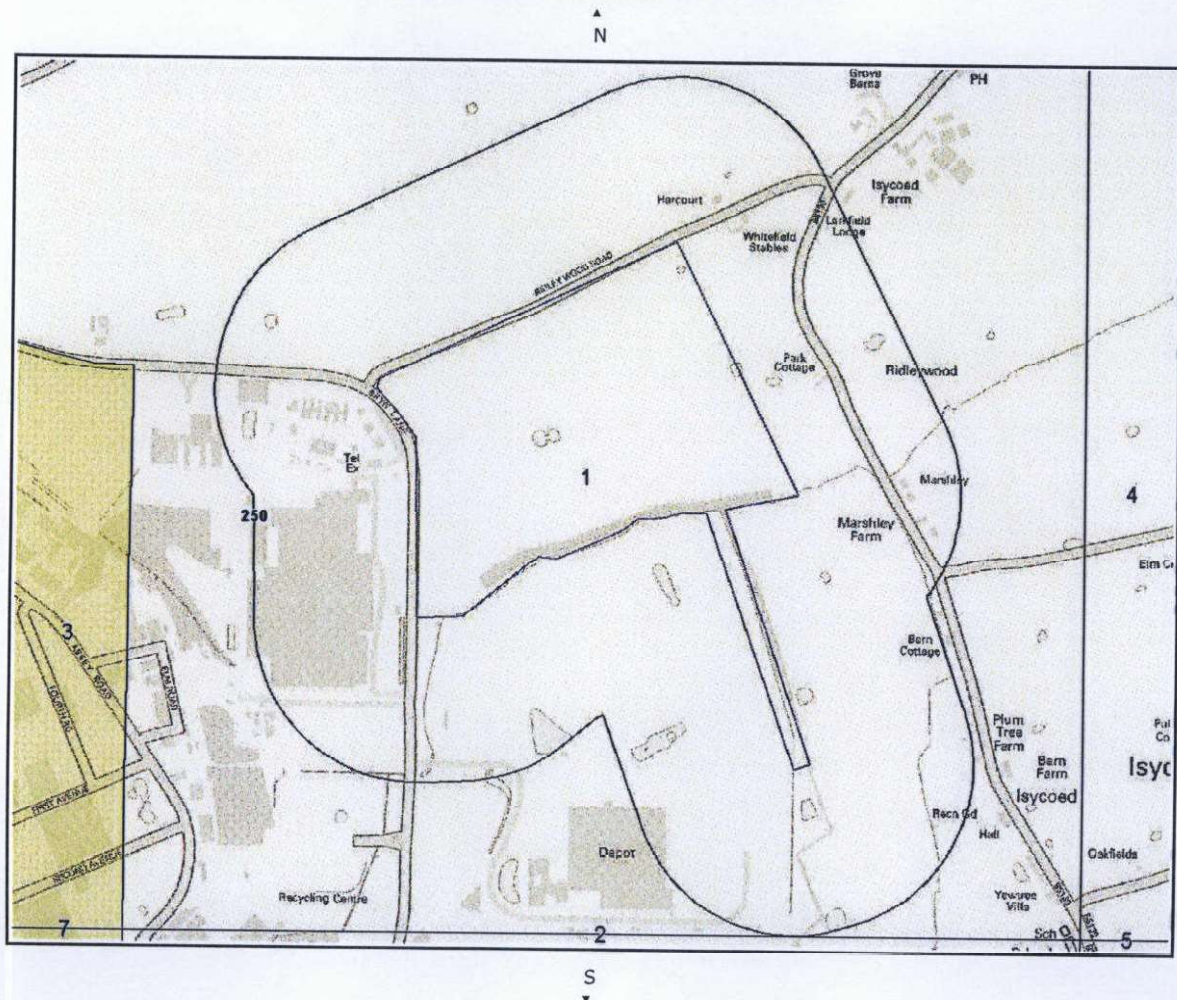
 Very Low

 Low

 Moderate

 High

4.4 Compressible Deposits Map



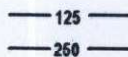
Compressible Deposits Legend



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Site Outline



Search Buffers (m)



No Data / Null



Negligible



Very Low



Low

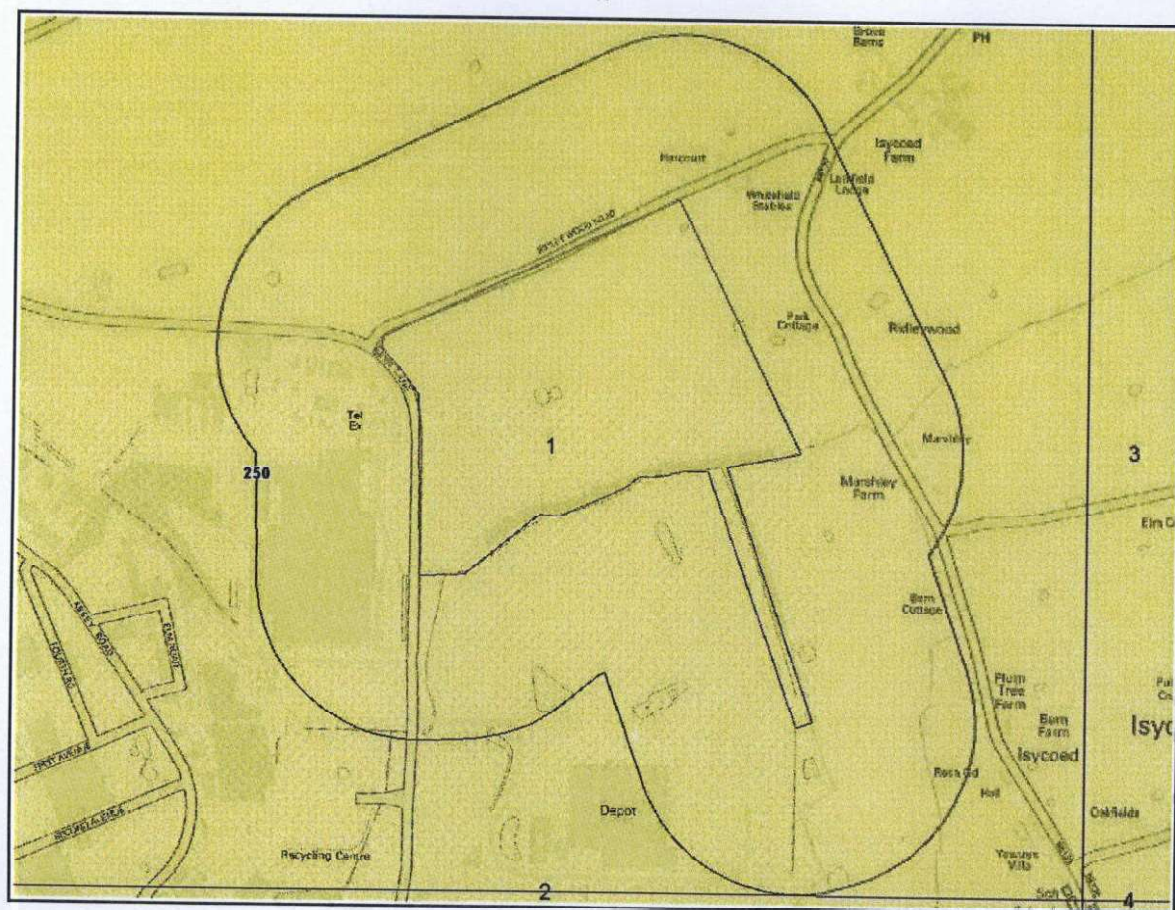


Moderate



High

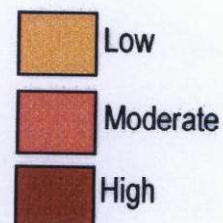
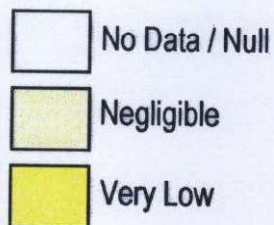
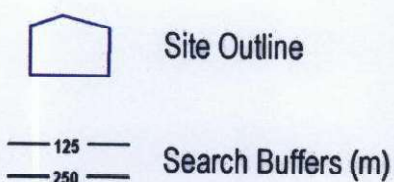
4.5 Collapsible Deposits Map



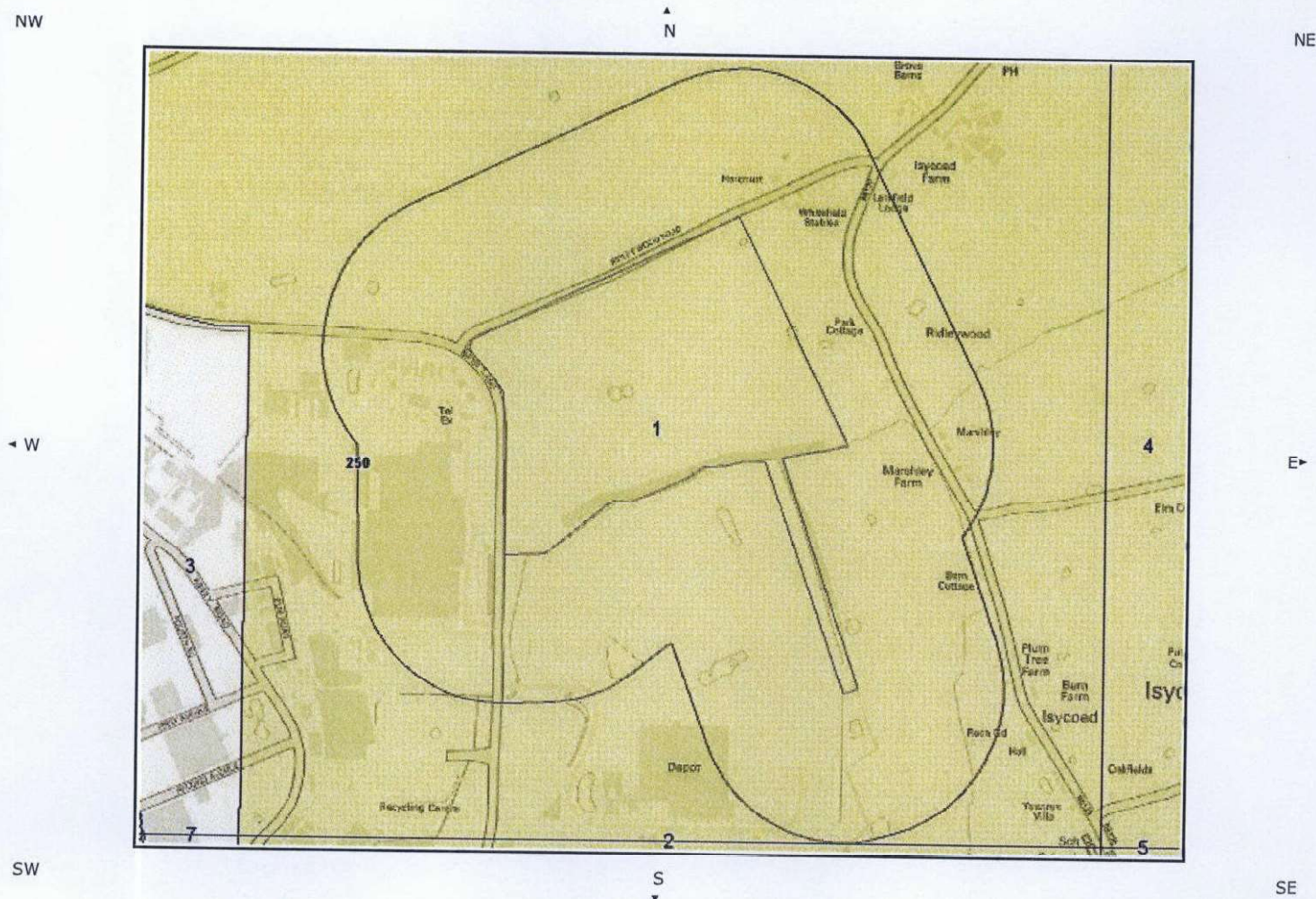
Collapsible Deposits Legend



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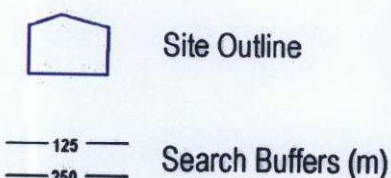
4.6 Running Sand Map



Running Sand Legend

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4. 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? **Very Low**

4.1 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.

4.2 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.

4.3 Ground Dissolution of Soluble Rocks

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

Distance (m)*	Direction	Hazard Rating	Details
0.0	On site	Null-Negligible	Soluble rocks are not present in the search area. 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.

4.4 Compressible Deposits

The following Compressible Ground 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.

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

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4.5 Collapsible Deposits

The following Collapsible Rocks information is 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.

4.6 Running Sands

The following Running Sands information is 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.